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CONTENTS

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Research Article

Current situation of athletes management at the youth football training centers

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ABSTRACT

Using reference materials, pedagogical observations, interviews, pedagogical tests, and statistical mathematics to assess the current situation of the management of athletes at the youth football training centers in all aspects: Current situation of the management of athletes; the advantages and limitations of the management of athletes at the youth football training centers.

Keywords: Athletes, Current situation, Management, Youth Football training centers

QUESTION

The training of young football players has not been clearly planned, but the work of training the youth was given to the local departments of culture and sports, if found capable, they will be trained. Realizing that youth football training has many shortcomings, recently, the Vietnam Football Federation has determined that in the regulation of professional football competition, clubs which want to participate in maintaining their competition in the V. League must ensure the condition of having at least four training routes for young athletes. This is a compulsion that also brings a positive effect in training young athletes.

At present, the work of training young athletes in Vietnam is particularly important; in addition to the Vietnam Football Federation establishing a training center for young athletes, the clubs also form youth training centers. However, these training centers are currently training in the style of "work at one's own discretion and preference," so there is no coherence and professional synchronous development.

To have a basis for providing solutions to improve the performance of youth training centers in Vietnam, we conducted the research: "Current situation of athletes management at the youth football training centers."

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RESEARCH METHODS

During the research, we use the following methods: Reference materials, pedagogical observation, interviews, and statistical mathematical methods.

RESULTS AND DISCUSSION

Assess the Situation of Athletes Management at the Youth Football Training Centers

According to the survey results on the current management of athletes in Vietnam, it can be classified into three management types and each form has completely different management characteristics:

- First: Football centers and clubs managed by the department of culture, sports and tourism (managed entirely by the state) such as Vinh Long and Hung Yen.
- Second: Football centers and clubs managed by the state and enterprises (managed mainly by the state): Song Lam Nghe An, Nam Dinh, and Quang Ninh.
- Third: Enterprise Football centers and clubs (managed independently by enterprises): Hoang Anh Gia Lai, PVF, and SHB Da Nang.

The survey was conducted at the training model centers in the form of: Full-time training, semi-full-time training, and part-time training. The results are presented in Table 1.

Table 1 shows that all three forms of management are managing and training athletes full time. For the model of managed

Table 1: Survey results of athletes training management forms at youth football training centers

No.	Training management forms	Football centers and clubs – managed entirely by the state	Football centers and clubs managed by the state and enterprises	Football centers and clubs managed independently by enterprises
1	Full-time training	x	x	x
2	Semi-full-time training	x	x	
3	Part-time training			

Table 2: Interview results about the organization of athletes management at youth football training centers (*n*=12)

No.	Organization of management	Management content	Interview result				χ^2	*P*
			Yes		No			
			n	%	*n*	%		
1	Time management	Meal time, sleep time, training time, time to learn the culture.	12	100.0	0	0.0	60	<0.001
2	Living activities management	Activities within residence, activities in practice, activities during competition time.	12	100.0	0	0.0		
3	Culture learning management	Study cultural subjects, study results, break time during the competition.	12	100.0	0	0.0		
4	Eating habits management	Nutrition in each meal.	12	100.0	0	0.0		
5	Management during the competition	Prepare procedures for athletes to compete; announce the competition contents; manage activities of eating, sleeping, resting for athletes to ensure the best health for competition.	12	100.0	0	0.0		

Table 3: Interview results with young football athletes at five youth football training centers on education (*n*=55)

No.	Interview content	Interview result						χ2	*P*
		Regularly, continuously		Not often		Not implemented			
		n	%	*n*	%	*n*	%		
1	Education in practice and competition								
	Self-discipline and positive spirit	46	8 3.6	9	16.4	0	0.0	64.84	<0.001
	Self-study, progressive	41	74.5	14	25.5	0	0.0	47.38	<0.001
	Modest, confident, willful, persistent, assertive	30	54.5	22	40.0	3	5.5	20.98	<0.001
	Help, support teachers, and friends	26	47.3	24	43.6	5	9.1	14.65	<0.001
2	Education in lifestyle								
	Comply with internal regulations of the center	55	100.0	0	0.0	0	0.0	110.0	<0.001
	Solidarity, ready to help people who are facing difficulties, talkative, social, cultured, and polite	43	78.2	10	18.2	2	3.6	51.53	<0.001
	Ensure good time for activities, practice, and competition.	55	100.0	0	0.0	0	0.0	110.0	<0.001
	Have good discipline	49	89.1	6	10.9	0	0.0	77.93	<0.001
	Keep the surrounding environment clean	38	69.1	12	21.8	5	9.1	32.98	<0.001
3	Participants in the education of athletes								
	Coaching staff of the subject department	55	100.0	0	0.0	0	0.0	110.0	<0.001
	Teachers who teach culture	55	100.0	0	0.0	0	0.0	110.0	<0.001
	Managers	55	100.0	0	0.0	0	0.0	110.0	<0.001
	Athletes raise the awareness of each other	38	69.1	11	20.0	6	10.9	32.33	<0.001
	Athletes educate themselves of moral	52	94.5	3	5.5	0	0.0	92.98	<0.001

Table 4: Current situation of the management at youth football training centers

TT	Management model	Name of typical center, club	Evaluate	
			Advantages	Limitations
1	Football centers and clubs managed entirely by the state	Vinh Long, Hung Yen, Hai Duong, Ha Nam ... (Training only children and teenagers)	Can take advantage of the existing local training ground system. State budget investment	Independent management activities. Low funding source for training: nutrition, wages, allowances. Degraded and outdated facilities. Limited in number and age of athletes training.
2	Football centers and clubs managed by the state and enterprises (managed mainly by the state)	Song Lam Nghe An, Nam Dinh, Than Quang Ninh, Hai Phong, Long An, Can Tho	Similar to the model of managed entirely by the State. Partially supported by the enterprises Enterprises are entitled to some tax or land rent preferences	Similar to the model of managed entirely by the State. Limitations on legal regulations. Enterprises may give up on sponsorship at any time.
3	Enterprise football centers and clubs (managed independently by enterprises)	Hanoi Club, Hoang Anh Gia Lai, Becamex Binh Duong, FLC Thanh Hoa, SHB Da Nang.	·Modern management organization model, professional operating apparatus Huge resources of funding, investment in facilities, training equipment Attracting talents due to the regimes and allowances for athletes, famous coaches	The survival of a club or a training center depends directly on the favor level of the team owners

entirely by the state and the model of managed by the state and enterprises, there is an addition form of semi-full-time training.

We assessed the current situation of the management of young football athletes. The results are presented in Table 2.

Table 2 shows that the management of athletes at every stage plays an important role, showing in 100.0% of the centers management is about time, living activities, cultural studies, meals, and competitions.

We conducted an interview with 55 young football athletes at five youth football training centers on the education of young athletes at five youth football training centers. The results are presented in Table 3.

Table 3 shows that the interview results are statistically significant with $P < 0.001$ between the three assessment levels: Regularly and continuously, not often, and not implemented. All athletes have a high self-education spirit and ensure compliance with the center's rules and regulations. In addition, the athletes also confirmed many participants participating in the education of young athletes.

Evaluate the Advantages and Limitations of the Management of Athletes at the Youth Football Training Centers

From these models of management, the activities management of each center and club has certain advantages and limitations. The results are presented in Table 4.

Table 4 shows the activeness in the management and administration of the club, investment, transfer business, as well as salary for athletes have had a positive impact on athletes' mentality. However, in some respects, professional clubs still have the "self" limitations which are the lack of long-term orientation in the development of the club (lack of training systems for young athletes or synchronicity) and the spontaneity in the management activities. Moreover, the core of a professional football club is to exist and develop as an "independent entity" with economic accounting; however, professional football clubs in Vietnam have not really run their business and earn money yet but still have to wait for the "investment" of business owners or the budget sources.

CONCLUSION

The management models of athletes training at the youth football training centers have three forms of full-time training including model of management entirely by the state, model of management by the state and enterprises, and semi-full-time training form.

Regarding the organization of the management of athletes at the young athletes training centers, it is shown that the centers manage the time, living activities, cultural studies, eating habits, and competition of athletes. Regarding the education of young athletes, it is shown that all athletes have high self-discipline and ensure the strict compliance with the center's regulations.

The management work at youth football training centers has the activeness in club management and administration activities, investment, transfer business, as well as salary for athletes, which have had a positive impact on the athletes' mentality. However, in some aspects, professional clubs still have the "self" limitations which are the lack of long-term orientation in the development of the club (lack of training systems for young athletes or synchronicity) and the spontaneity in the management activities.

Article Source

The article excerpts from the results of ministerial-level scientific research project: "Current situation and solutions to improve the performance of training centers for young football athletes in Vietnam," protected in 2018.

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Review Article

Current situation of environmental protection work in sports and physical training activities at residential areas and public places

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ABSTRACT

For a developing country like Vietnam, environmental pollution is becoming more and more present in the development process. A difficult problem posed from many years ago for Vietnam is to harmoniously deal with the problem happened between environmental protection and socioeconomic development. Physical training and sports are a field with close relationships with other sectors and fields in society. However, environmental protection in the field of physical training and sports has not been paid adequate attention, and there are very few specific and practical activities of the physical training and sports sector in the environmental protection movement for the past few years.

Keywords: Environmental protection, Physical training and sports activities

INTRODUCTION

Activities to raise awareness of environmental protection in professional sports tournaments and sports movements have not been developed, although there are appropriate and highly effective times to be able to propagate as a far-reaching way to a substantial number of inhabitants. In addition, up to now, our country's physical training and sports industry have not had any document or document's part of published books on the environment of physical training and sports activities (including environmental protection in sports competition). In the most important legal documents of the physical training and sports sector such as the Law on Physical Training and Sports, the Vietnam strategy on physical training and sports development till 2020, etc., of which the contents related to environmental protection in the field of physical training and sports are also not mentioned. Since then, we have conducted a research on "*Current situation of environmental protection in physical training and sport activities at residential areas and public places in Vietnam.*"

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RESULTS AND DISCUSSION

The results of the survey on environmental quality in the sport centers and clubs demonstrate that there are pollution or low pollution rates in these facilities, namely:

- Air pollution due to the surrounding environment factors accounting for a high percentage (6.95%), together with a low level of pollution accounting for 26.55%
- Wastewater pollution is 2.73%, the rate of the low level of pollution is 21.84%
- Waste pollution is 2.48% and the low level of pollution is 27.79%
- Pollution due to mold and moisture accounts for 5.21%, with a low level of pollution 28.04%.

There are also some other pollutants accounting for 11.7%.

The results of the survey on the status of environmental management and protection work in sport centers and sport clubs show that establishments that ensure adequacy and frequency account for a high percentage of performing the environmental control (72.46%), parking place does not affect the training environment (77.92), have energy and water-saving solutions (62.28%), cultural environment (60.05%), and propaganda for environmental protection (66.50%).

Sports centers and clubs all have unadequate or infrequent rates in specific environmental protection tasks, such as public toilets (42.18%), trash cans (43.67 %), tackling noise and dust (44.42%), designing pollution treatment systems (38.46%), and food and beverage service places (35.48%).

The results of the environmental quality survey at 270 yards and gymnasiums in public physical training and sports areas [Table 3] show that the pollution rate is low due to the following pollutants:

- Air pollution by the surrounding environment factors accounts for 7.40% and has a low level of pollution at 16.30%.
- Wastewater pollution (5.19%) and low level of pollution at 12.12%.
- Waste pollution has a rate of 3.70% and a low level of pollution is 16.67%.
- Pollution caused by mold and moisture of the ground, yard, walls, and training equipment has the rate of 5.93% and a low level of pollution is 19.26%.

Pollution by some other pollutants accounts for 5.56%.

Actual Situation of Environmental Management and Protection at Yards, Gymnasiums, and Campuses with Public Physical Training and Sport Activities

The results of the survey on the status of the management of environmental protection in yards, gymnasiums, and parks carrying public sport activities [Table 4] demonstrate that the factors that ensure the environmental management account for a high proportion such as parking place does not affect the environment (84.44%), fire prevention (69.63%), performing environmental control (67.41%), and toilets that ensure hygiene (66.67%) and ensuring cultural environment (66.30%).

Factors with a high level of uncertainty consist of: Having no measures to tackle the effects of noise and dust caused by vehicles (41.48%), toilets which not sufficiently met the requirements for trainees (34.07%), no table of environmental protection rules (42.59%), no environmental protection manager (36.67%), and no trash can (32.59%).

Table 1: Results of a survey of environmental quality in sports centers and clubs (*n*=403)

Survey contents	Survey results (%)		
	Polluted	Low level of pollution	Unpolluted
Air pollution by the surrounding environmental factors (factories, production facilities, and vehicles…)	6.95	26.55	66.50
Pollution by wastewater	2.73	21.84	75.43
Pollution by waste	2.48	27.79	69.73
Pollution caused by mold and moisture of the ground, yard, walls, and training equipment…	5.21	28.04	66.75
Some other pollutants	11.17	-	88.83

Table 2: Survey results on the status of environmental management and protection at sports centers and clubs (*n*=403)

Survey contents	Survey results (%)		
	Not available	Yes but not frequent, not inadequate	Frequent and adequate
Performing the environmental control of the management unit	5.46	22.08	72.46
Having designed pollution treatment system (wastewater and waste)	22.58	38.46	38.96
Regularly implementing solutions to save electricity and water, etc.	12.66	25.06	62.28
Having designed and used fire and explosion prevention and fighting equipment, etc.	11.91	29.78	58.31
Having trash cans at the training site	-	43.67	56.33
Parking place does not affect the training environment	3.23	18.86	77.92
Public toilets must ensure hygiene and be adequate for trainees	-	42.18	57.82
Foodservice activities, shops, etc., ensure hygiene for practitioners	6.45	35.48	58.06
Having measures to tackle the effects of noise and dust caused by vehicles	9.43	44.42	46.15
Ensuring the cultural environment at the training site (preventing public disorder, fighting, profanity, social evils, etc.)	6.95	33,00	60.05
Having people to manage and propagandize environmental protection	-	33.50	66.50
There are tables of environmental protection rules at the physical training and sport establishments	38.46	-	61.54

Table 3: Results of a survey of environmental quality in yards, gymnasiums, and campuses with public physical training and sport activities (*n*=270)

Survey contents	Survey results (%)		
	Polluted	Low level of pollution	Unpolluted
Air pollution by the surrounding environmental factors (factories, production facilities, and vehicles)	7.40	16.30	76.30
Pollution by wastewater	5.19	12.22	82.59
Pollution by waste	3.70	16.67	79.63
Pollution caused by mold and moisture of the ground, yard, walls, training equipment, etc.	5.93	19.26	74.81
Some other pollutants	5.56	-	94.40

Table 4: Results of a survey on the status of environmental management and protection at yards, gymnasiums, and campuses with public physical training and sport activities (*n*=270)

Survey contents	Survey results (%)		
	Not available	Yes but not frequent, not inadequate	Frequent and adequate
Performing the environmental control of the management unit	7.78	24.44	67.78
Having designed pollution treatment system (wastewater and waste)	27.78	32.59	39.63
Regularly implementing solutions to save electricity and water, etc.	12,59	21.58	65.56
Having designed and used fire and explosion prevention and fighting equipment, etc.	13.70	16.67	69.63
Having trash cans at the training site	-	32.59	67.41
Parking place does not affect the training environment	2.22	13.33	84.44
Public toilets must ensure hygiene and be adequate for trainees	-	33.33	66.67
Foodservice activities, shops, etc., ensure hygiene for practitioners	10.74	34.07	55.19
Having measures to tackle the effects of noise and dust caused by vehicles	9.26	41.48	49.26
Ensuring the cultural environment at the training site (preventing public disorder, fighting, profanity, social evils, etc.)	4.81	28.89	66.30
Having people to manage and propagandize environmental protection	-	36.67	63.33
There are tables of environmental protection rules at the physical training and sport establishments	42.59	-	57.41

Table 5: Results of surveys on environmental quality at physical training and sport locations in parks, flower gardens, lakeside, riverbanks, and coastal areas (*n*=278)

Survey contents	Survey results (%)		
	Polluted	Low level of pollution	Unpolluted
Air pollution by the surrounding environmental factors (factories, production facilities, and vehicles)	14.03	29.50	56.47
Pollution by wastewater	11.87	24.10	64.03
Pollution by waste	13.31	30.94	55.76
Some other pollutants	16.91	-	83.09

Actual Situation of Environment Quality at Sport and Physical Training Locations at Parks, Flower Gardens, Lakeside, Riverside, and Coastal Areas

The results of the survey on environmental quality in public places where people practice physical exercises (parks, gardens, lakeside, and coastal area) demonstrate in Table 5.

Air pollution (14.03%) and low level of air pollution (29.05%) totally account for 43.53%. This is a relatively high percentage of air pollution in public areas.

The rate of wastewater pollution (11.37%) and the pollution of waste (13.31%) with the low-level pollution rate shows that the pollution of waste in general (wastewater – 35.97%) and

Table 6: Survey results on the status of environmental management and protection at physical and sport training activities in parks, flower gardens, lakeside, riverside, and coastal areas (*n*=278)

Survey contents	Survey results (%)		
	Not available	Yes but not frequent, not inadequate	Frequent and adequate
Performing the environmental control of the management unit	-	49.64	50.36
Having designed pollution treatment system (wastewater and waste)	36.69	34.17	29.14
Having trash cans at the training site	-	53.60	46.40
Parking place does not affect the training environment	-	45.68	54.32
Public toilets must ensure hygiene and be adequate for trainees	-	51.44	48.56
Foodservice activities, shops, etc., ensure hygiene for practitioners	-	63.67	36.33
Having measures to tackle the effects of noise and dust caused by vehicles	21.58	52.88	25.54
Ensuring the cultural environment at the training site (preventing public disorder, fighting, profanity, social evils, etc.)	9.35	43.17	47.48
Having people to manage and propagandize environmental protection	-	65.47	34.53
There are tables of environmental protection rules at the physical training and sport establishments	61.87	-	38.13

(waste –44.25%) is a high rate at public physical training and sport activities areas.

Actual Situation of Environmental Management and Protection at Physical Training and Sport Places at Parks, Flower Gardens, Lakeside, Riverside, and Coastal Areas

The results of the survey on the status of environmental management and protection at public places with sport management activities demonstrate in Table 6.

Most of the factors that adequately and frequently ensure environmental management and protection are below 50%, especially those with low rates, such as the design of pollution treatment systems (29.14%), having measures to tackle the effects of noise and dust (25.54%), having people to manage and propagandize environmental protection (34.53%), and having environmental protection rules (38.13%). This is the fundament for a corrective orientation to improve the rate of ensuring environmental management and protection factors in public sport and physical training places.

CONCLUSION

The actual situation of managing sports and physical training activities in residential areas and public places is as follows:

- In terms of management subjects, sport centers and clubs managed by the state account for 47.15%; in the yards, gymnasiums, and campuses with public sports and physical training activities, the rate of state management is 67.41%. The rate of physical training and sport facilities managed by enterprises and individuals in sport centers and sport clubs accounted for a higher proportion (52.85%), compared to yards, gymnasiums, and campuses with public sports and physical training activities (22.96%)
- In terms of the size of physical training and sport facilities, the centers and clubs only have gymnasiums, accounting for 54.09%, while in yards; gymnasium is only at the rate of 22.59%. The physical training and sport facilities of these two types have the size of both gymnasiums and outdoor yards, accounting for nearly the same proportion (23.83% and 22.59%). The yards, gymnasiums, and campuses where the physical training is conducted outside are high with 52.54%
- The number of people practicing at the high frequency at centers and sports clubs includes aerobics (31.27%), dancing and sports dancing (29.03%), and practicing with weights and bodybuilding (34.49%); the types of exercise with a ratio of 15%–20% include Ayurvedic training (19.35%), badminton and shuttlecock kicking (19.11%), football (19.60%), volleyball (18.36%), table tennis (15.63%, and martial arts (16.87%) compared with the rate of the type of exercise mentioned above, in the yards gymnasiums and campuses, the percentage of exercise is higher in types such as badminton or shuttlecock kicking (49.26%), volleyball (31.85%), and Ayurvedic training (28.52%); the types of exercise the rate of aerobics are similar (31.48% and 31.27%), the remaining types of exercise do not have much distinctions; for public sport and physical training facilities at parks and gardens flowers, lakeside, riverside, and survey, results demonstrate that there is only a focus on the types such as training on fixed equipment, running and walking, Ayurvedic exercise, physical exercise, and cycling and the two most popular sports are badminton and shuttlecock kicking.

Through the above results, it is shown that the physical training and sport establishments have organized training activities in public's favorite sports that this is the fundament for development's orientation of appropriate environmental protection criteria which are suitable with the training activities of the public in different types of physical training and sport establishments.

Excerpt the Article at the Topic

"*Building criteria for environmental protection in sports and physical training activities in residential areas and public places*" The Ministry of Culture, Sports and Tourism's level project has been accepted in 2017.

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Review Article

Training program with application of scientific solutions in training process for senior weightlifting athletes

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ABSTRACT

The subject carries out professional and biomedical solutions; solutions on nutrition to the national weightlifting team's training program and plan in 2015 and addition to the 2014 plan, with testing, evaluation, and analysis at the time before the experiment process, between experiment and post-experiment to be able to coordinate with the coach to adjust training program as well as evaluate athletes' ability to develop training level.

Keywords: Athlete training, Scientific solution, System

INTRODUCTION

The training time is strictly managed by coaches in each group, excluding the objective factors affecting the training, to separate only the impacts of scientific solutions on each research team. After the experimental program has been identified for the experimental group, based on the plan of five weightlifting training at the National Sports Training Center under the general guidance of weightlifting – high achievements at sports – of General Department of Physical Training and Sports, the subject has been conducting the training program for research subjects with the application of scientific solutions.

Based on scientific training, in which training time is 6 days per week (from Monday to Saturday, and Sunday is a break day). The training period is from 120 min to 180 min per session, in which the development of professional strength is 6 sessions/week and is included in the physical training of the lesson plan. The total number of training sessions in the experimental period (from June 2014 to June 2015) is roughly 500 sessions. Training time is based on the purpose of developing for each physical strength qualification according to each training period.

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RESEARCH'S RESULT AND DISCUSSION

Training Program in the Annual Training Cycles

Main training content

- General physical strength training and professional physical strength training
- Professional training
- Psychological training.

General preparation period: 73 days

In which professional training time accounts for 67% of total hours, professional strength training accounts for 12% of total hours.

- Physical strength training:

Physical strength training's time accounts for about 40% of the total training hours.

- General physical strength training
- Professional physical strength training
- Professional strength training.

Conducting monthly tests to assess the athlete's training level with 12 selected tests to have a well-timed adjustment plan.

Professional preparation period: 104 days

Physical strength training's time accounts for about 30% of the total training hours, of which strength training accounts for 12% of the total of general hours.

- Professional physical strength training

In this time, to strengthen professional physical strength, maintain general physical strength by using push-ups, jump burpee push-up, short distance running, endurance running, exercise games, etc. Enhancing exercises with tools such as plate weights, dumbbells, and kettlebells for the purpose of increasing endurance receptors of the anterior, posterior, deltoid, forearm muscle groups.

- Professional strength training

The main task is to enhance professional strength for athletes using specialized strength training exercises in combination with other specialized physical training contents in one training lesson plan.

Testing and evaluating monthly the training level by 12 selected tests to have a well-timed adjustment plan.

- Technical training.

In this period, the athletes have trained based on the technical movements of the previous period to equip athletes in term of skills and tactics.

Requirements when using professional strength training exercises for senior weightlifting athletes during general and professional preparation.

Use the exercises to develop the professional strength of the parts of the body in a synchronized and uniform way.

Thus, the development of professional strength for senior weight-lifting athletes in the preparation period must comply with the following factors:

Volume of training: Training time for professional strength is usually applied at the beginning or the middle of a small cycle (weekly cycle). The training time for each lesson plan to enhance professional strength is not large to ensure that the athletes always maximize the speed of movement and maintain the excitement of training.

Training intensity: The total intensity is relatively large, but the small load weight must be used to ensure maximum and speedy capacity development.

Training method: Using the repeated method, the circle method, the discontinuous method, etc.

Competition period: 78 days

The time for physical training accounts for 20% of the total hour, of which strength training accounts for 8% of the total of general hours.

Requirements when using professional strength training exercises for senior weightlifting athletes during competition.

During this period, strength training must be closely combined with tactical, psychological, and physical training. The main task of this period is to create athletes the best state, which is full of strength of sport state, to enter the competition.

The exercises used mainly associated with professional exercises, competition exercises, exercises to improve coordination and exercises to reinforce the tactics of athletes and using those exercises during the period to ensure the following requirements:

The size of movement volume: Depending on the purpose of each training session, the load weight can be from 50% to 70% or 60% to 90% of the weight for a maximum effort that the athlete can reach. In training, the technical structure of the movement and the method of action of the muscles must be similar to the competition exercises.

Speed of exercise completion: Professional strength training exercises should use average speed. Improving professional-strength usually uses average speed, and while developing speed-strength mainly uses maximum speed.

Time to complete the exercises: It must be ensured that when completed the exercises, the athlete's speed will not be decreased. The duration of the exercise is determined by the number of repetitions, load weight, exercise structure, and training level of the athlete.

Duration and property of the break must ensure the athletic performance capacity with adequate recuperation conditions. Because it depends on the number of muscles involved in the work, the characteristics of the athlete's recuperation process and also training level.

Number of exercises in a training session: The number of exercises in a training session is not excess, but should be based on the property and effect of the exercise.

Movement intensity: Use large, medium, and small intensity. When using moderate (medium) intensity, the strength factor develops, while for developing the speed of movement, the smaller intensity is used.

Volume: The number of times and the number of sections are for the purpose of developing the speed of the deciding movement. The training time is not long but must reach the highest frequency. Attention when developing speed and strength of muscles always takes the maximum frequency as a milestone to decide the time, the number of exercises between breaks, which must ensure recuperation but not too long that can lead to reduced excitement.

Method of movement must be gradual and keep long, pay attention to the technical specification of the movement.

Competition Phrase

This phrase mainly focuses on exercises which are similar to the competition, at the same time, as the competition and adjusting the dropping point for the athletes to enter the competition in the best spirit.

Transition Phrase

This period allows the athlete to rest actively, preparing for the next training cycle.

Process of Applying Scientific Solutions in Training Programs

The process of applying scientific solutions in term of expertise, nutrition, and biomedical, the topic is based on the annual training cycle and approaches according to each team's lesson plan, from which to plan the application, test technically, psychologically, and educationally professional specifications to assess and adjust the amount of movement to suit the conditions of practice, competition, and ability of the athletes.

During the training year, the average number of training hours per day is 4 h–6 h, 2 sessions a day. In the final weeks of competition and the transitional weeks, the amount of exercise can be declined by reducing the number of training sessions and reducing the time for each training session. Based on the content of professional, scientific solutions, nutritional solutions, and biomedical solutions applied in the annual training program for senior weight-lifting athletes, the topic conducts the application process for each month, week, and day in each training period of the annual training plan as following table [Table 3].

Table 1: Distribution content of professional strength training according to weekly general and professional preparation

Time	Training content
Monday	Professional strength and endurance training
Tuesday	General strength training
Wednesday	Professional strength training
Thursday	Professional strength and speed training
Friday	Adjustable training (strengthening professional-strength)
Saturday	General strength training
Sunday	Recuperation

Table 2: Distribution content of professional strength training according to weekly period of refinement and competition

Time	Training content
Monday	General strength training
Tuesday	Professional strength training
Wednesday	Adjustable training (enhancing strength and endurance)
Thursday	Professional strength training
Friday	Adjustable training (enhancing professional-strength)
Saturday	Competition
Sunday	Recuperation

From the construction, the results from Table 3 shows that he entire annual training plan for senior weightlifting athletes is built into the pedagogical experiment program included three periods, so scientific solutions (professional solutions, nutritional solutions, and biomedical solutions) are specifically applied as follows:

General preparation period: 73 days

The applied scientific solutions include:

- Professional solution: Applying the content, standards to test and assess the training level of athletes every 1 month
- Solutions for nutrition and supplements (functional foods): Apply the menus for athletes and supplements for athletes on a daily basis (according to the new menu that has been constructed)
- Biomedical solution: Examining functions and testing hematological indicators (be recommended to apply the test at the end of the general preparation period).

Professional preparation period: 104 days

- Professional solution: Applying the content, standards to test and assess the training level of athletes every 1 month
- Solutions for nutrition and supplements (functional foods): Apply the menus for athletes and supplements for athletes on a daily basis (according to the new menu that has been constructed)
- Biomedical solution: Examining functions and testing hematological indicators (be recommended to apply the test at the end of the professional preparation period).

Table 3: Process of application of scientific solutions in the senior weight-lifting athletes training program

Training period	Scientific solutions to apply	Time to apply
General preparation	Professional solution	One time per month
	Nutritional solution	Daily meals for athletes
	Biomedical solution	End of period
Professional preparation	Professional solution	One time per month
	Nutritional solution	Daily meals for athletes
	Biomedical solution	End of period
Competition	Professional solution	One time per month
	Nutritional solution	Daily meals for athletes
	Biomedical solution	Before the competition

Competition period: 78 days

- Professional solution: Applying the content, standards to test, and assess the training level of athletes every 1 month
- Solutions for nutrition and supplements (functional foods): Apply the menus for athletes and supplements for athletes on a daily basis (according to the new menu that has been constructed)
- Biomedical solution: Examining functions and testing hematological indicators (be recommended to apply the test before the time of competition).

CONCLUSION

The annual training cycle has enhanced training to improve technical quality, stability in athletes' movements, equip athletes with psychological knowledge, and give athletes a state of being ready to practice and compete. In addition, developing a personal lesson plan in the training program to apply the right amount of movement to each athlete, thereby adjusting the amount of movement, creating the best dropping point to help the athlete have the most energetic state at the times of competitions of the year.

Through the process of applying scientific solutions in term of professional, nutrition and biomedical aspects, the topic has based on the annual training cycle and approaches for each team lesson plan, from which to plan the application and check technical, psychological, and educational specifications to assess and adjust the amount of movement to suit the training conditions, competitions, and qualities of the athletes.

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Review Article

Evaluation of current situation and desire of the people for sports and physical training activities

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ABSTRACT

The current state of the environment in the world is under tremendous pressure from such issues as increasing environmental pollution, biodiversity deterioration, climate change, chemical pollution, and waste problems that continue to pose a threat to ecosystems and human health. Therefore, environmental health is not only considered at the individual level (personal hygiene and environmental awareness), community (traditions, lifestyle, and customs), and the country (environmental protection and community health-care strategy, economic, cultural, and social development in each region) but also a global problem.

Keywords: Operational environment for physical training and sports

INTRODUCTION

There is a certain impact of each environmental factor on health. Good health is a good adaptation of the body to the environment, whereas an illness is a sign of inadaptability. Thus, health is a standard of the adaptation of the human body to environmental conditions and is also an environmental assessment standard. In recent years, the socio-economic development has adversely affected the environment quality and human health, so the environmental health issue has received a great deal of attention in many countries all around the world.

RESULTS AND DISCUSSION

The results of the special training activities survey in residential areas and public places [Table 1] are the fundament for orienting elements and necessary conditions to ensure sports and physical training facilities for the public. The survey results demonstrate that:

- The gender ratio of trainees is nearly equal, 52.38% for male, and 47.62% for female
- The rate of training 3 times and over 3 times a week is common (28.48% and 37.80%)
- Training time from 1 h to 2 h in one workout with a high rate (60.59%)
- The form of training with a high percentage is practicing as a group with friends (54.58%)
- The reason for participating in the exercise with the highest rate is health (60.03%) and interest in sports and physical training (30.05%).

People's Evaluation on Environmental Protection at Sports and Physical Training Sites

Survey results on assessments of people on the management and environmental protection at sports and physical training sites [Table 2] demonstrate that there is air pollution containing the rate of 11.25% and there is the pollution of at least 34.00%.

Waste pollution, including wastewater pollution, accounts for 10.73%, and rubbish pollution is 12.23%. However, the rate of the low level of pollution also accounts for a high proportion according to the people assessment (31.62% and 38.02%).

Factors that ensure environmental management and protection with inadequate or infrequent ratios include regulations on activities of food and beverage service (50.66%) and infrequently ensured hygiene toilets (58.48%), affected by noise and dust caused by vehicles (affected of 33.70% and having a low effect of 41.23%).

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Table 1: Survey results of the properties of training activities of the people in residential areas and public places (*n*=2862)

Survey contents	Ratio (%)
Gender	
Male	52.38
Female	47.62
Number of sports and physical training exercises in the week (times)	
1	9.26
2	24.46
3	28.48
Over 3	37.80
Average training time each time (h)	
Under 1 h	25.93
From 1 to 2 h	60.59
Over 2 h	13.48
Training form	
Practicing alone	25.19
Practicing with family	8.60
Practicing as a group with friends	54.58
Practicing as a member of public sports and physical training club	11.15
Another form	0.49
The reason for participating in the workout	
Health	60.03
Interest in sports and physical training	30.05
Healing	1.29
Entertainment	6.08
Group activities	2.24

Desire of the People on Environmental Protection Conditions at Sports and Physical Training Sites

Surveying the people's desire for environmental protection conditions at sports and physical training sites demonstrates that opinions on the conditions to ensure environmental protection are accounted. Over 90% of participants want [Table 3].

CONCLUSION

Assessing the situation and the desire of the people in the physical training and sports environment:

- In terms of environmental pollution: There is air pollution 11.25% and a low level of pollution is 34.00%; waste pollution, including wastewater pollution, accounts for 10.73% and the rubbish pollution is 12.23%, the proportion of the low level of pollution accounts for a high rate according to the assessment of the people (31.62% and 38.02%)
- The factors that ensure the environmental management and protection with inadequate or infrequent ratios include regulations on activities of food and beverage service (50.66%) and infrequently ensured hygiene toilets (58.48%), affected by noise and dust caused by vehicles (affected of 33.70% and having a low effect of 41.23%)
- Surveying the people's desire for environmental protection conditions at sports and physical training sites demonstrates that opinions on the conditions to ensure for environmental protection are accounted. Over 90% of participants want [Table 3].

Excerpt the Article at the Topic

"*Building criteria for environmental protection in sports and physical training activities in residential areas and public*

Table 2: Survey results on the assessments of people on the environment at physical training and sport sites (*n*=2862)

Evaluation content of people	Survey results (%)		
	Have	Yes but few	Have not
There are air pollution by the environment around	11.25	34.00	54.75
There is wastewater pollution	10.73	31.62	57.65
There is waste of pollution	12.23	38.02	49.76
There is pollution due to mold and moisture of yard, walls, and training equipment	9.40	34.98	55.62
There is a pollution by a number of agents	9.75	-	90.25
Affected by noise and dust caused by vehicles	33.30	41.23	25.47
Equipped with waste disposal bins	47.52	52.48	-
Public toilets ensure a clean and adequate conditions of training	41.72	58.28	-
Places of food and beverage service and shops ensure hygiene and cleanliness	39.17	50.66	10.17
The training site has smokers and bad manner people	12.33	43.61	44.06
The training site has a manager who is frequently reminded to keep the sports and physical activity environment clean and healthy	35.64	31.17	33.19
The training site has a table of environmental protection of sports and physical training rules	51.61	-	48.39

Table 3: Results of a survey on the wishes of the practitioner about environmental protection conditions at the place of physical training and sports (*n*=2862)

Desirable ideas of the people	Survey results (%)	
	Have	Have not
Expect to have or have more fixed training equipment for training	74.21	25.79
Expect to have many garbage bins to avoid littering at the training site.	90.18	9.82
Expect the training site to have a clean public toilet to sufficiently serve the people	91.09	8.91
Expect a large training area, so as not to be hustle during training.	91.89	8.11
Expect the training site is not affected by noise and dust	-	100
Expect the training site to have many trees, flower-growing areas, and shaded areas	92.17	7.83
Expect the training site to have a reminder board so that the people do not smoke, swear, argue, and insult each other	92.31	7.69
Expect the training site has a number of reminders to protect the environment of sports and physical training activities	92.42	7.58
Expect the training site regularly to communicate and educate the regulation environment of physical training and sports activities	91.86	8.14
Expect the training place to have a manager to remind the practitioner to preserve the regulation environment of physical training and sports	91.40	8.60
Expect the name of the training site would be put into the public media and an annual rating on environmental protection in sports and physical training activities	89.48	10.52
Expect the training site is not affected by food and beverage outlets that affect exercise or sanitation	89.83	10.17

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Research Article

Incidence of retinopathy of prematurity and some risk factors in premature infants at Haiphong Children Hospital from March 2017 to September 2018

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ABSTRACT

Objectives: The research was done to estimate the incidence of retinopathy of prematurity (ROP) in premature infants (PIs) in the intensive care unit and the Neonatal Department of Haiphong Children Hospital from March 2017 to September 2018 and describes some associated factors with ROP in studied subjects. **Subjects and Methods:** Studied subjects included 171 pairs of PIs and their mother. PIs had at the same time birth weight (BW) <2000 g and gestational age (GA) <34 weeks. The method was a cross-sectional study. The data collection included eye screening for ROP classification and definitions and history taking. Retinal examinations were done by experienced ophthalmologists after birth 3–4 weeks. The revised 2005 International Classification of ROP, which describes ROP according to the location (zones) and severity of abnormal vascularization (stages), is used to classify and record the ophthalmologist's findings based on retinal examination. Univariate analysis and multinomial logistic regression were proceeded with some associated factors including GA, BW, O_2 dependence ≥14 days, invasive mechanical ventilation, blood transfusion ≥3 times, SGA, maternal breastfeeding, infection, BPD, PDA, and surfactant use. OR and 95% CI of OR were computed to estimate the relationship of a risk factor with ROP. Meantime, Chi-square test was used to compare the incidence of ROP. **Results:** The incidence of ROP in PI was 38.0%, in which 25.3% were mild and 25.7% severe. ROP was frequently encountered in PI with GA ≤28 weeks (100%), in PI with BW ≤1750 g (94.4%), and in an urban area 17.3%. GA <32 weeks and O_2 dependence more than or equal to 14 days were strongly associated with ROP (OR = 22.89 and OR = 6.85), respectively. Blood transfusion more than or equal to 3 times was inversely associated with ROP (OR = 0.22). **Conclusions:** In daily practice in the intensive care unit and in the Neonatal Department, neonatologists must be conscious of the maintenance of suitable SpO_2 to avoid the development of ROP in PI. Moreover, tight management of pregnancies must be done to reduce; as much as, we can the prevalence of PI.

Keywords: Incidence, Preterm, Retinopathy of prematurity, Risk factors

INTRODUCTION

Retinopathy of prematurity (ROP) is an eye disease that can lead to blindness. In premature infants (PIs) with ROP, abnormal blood vessels grow on the retina of each eye. The disease often occurs in PI with a long history of high FiO_2 dependence.[1]

In the world, ROP was the first time described by Terry in 1942.[2] Since then, ROP has become more frequent and a common cause of blindness in children. Nowadays, ROP is believed to have a multifactorial etiology, particularly the role of oxygen in the pathological mechanism. On the other hand, researchers found that gestational age (GA) and birth weight (BW) were strongly related to the development of ROP. Other factors such as intraventricular hemorrhage, blood transfusion, neonatal infections… were also associated factors of ROP.[3]

The prognosis of ROP depends much on morphological lesions, disease stage, intervention time, and treatment method. If PI are not screened in time, PI with severe ROP will suffer from blindness whole their life. Meantime, thanks to advances in neonatal resuscitation, the number of surviving PI increases substantially that increases the number of associated factors and the rate of ROP.

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In Vietnam, since 2001, screening programs for ROP have been done in some big cities such as Hanoi, Hochiminh… and some research on ROP has been studied by ophthalmologists.[4,5] According to these ophthalmologists, the incidence of ROP in Vietnam was higher than that of developing countries.[6] From the results of these studies, a "Guidelines for taking care of PI, ROP screening, its treatment, and follow-up ROP in PI" were already completed in 2011.[1]

In Haiphong, since 2006, the program for ROP screening has been applied, but studies on ROP were not carried out at all. Due to that, we had an idea to do this research on ROP in Haiphong Children Hospital.

SUBJECTS AND METHODS

Research Design

It was a cross-sectional study.

Research Subjects

A cumulative sample size of 171 pairs of PIs and their mother were eligible and included in the study. The sample process was completed using the purpose sampling method. PI who met inclusion criteria were selected for the study.

Inclusion/Exclusion Criteria

- All PI were hospitalized in the intensive care unit and the Neonate Department of Haiphong Children Hospital from March 2017 to September 2018
- Their BW was ≤2000 g and their GA ≤34 weeks (we expanded BW to ≤2000 g and GA to ≤34 weeks because these PI often had comorbidities such as respiratory failure, pneumonia, prolonged oxygen therapy, and infections.[1]
- PI with eye diseases that prevent their retinal examination
- PI were older than 34 weeks and weighted more than 2000 g
- Their parent did not agree to participate in the study.

Data Collection Procedures

Some general information such about studied subjects such as sex, GA, BW, delivery method, causes of preterm birth, and living place was collected by taking a medical history and thoroughly studied medical records birth and living place of participants were done by taking a medical history, studying thoroughly medical record, and performing the echocardiogram. Furthermore, we strictly followed the infant treatment process to choose real cases of BPD that met inclusion criteria.

ROP, including Type 1 and Type 2, was diagnosed using the criteria from the revised 2005 International Classification of ROP.[7]

Definition of some risk factors: Sex of subjects (male/female), GA <32 weeks and ≥32 weeks, BW <1750 g and ≥1750 g, O_2 dependence ≥14 days (yes/no), invasive mechanic ventilation (yes/no), blood transfusion ≥3 times (yes/no), SGA (yes/no), maternal breastfeeding (yes/no), infection (yes/no), and BPD was defined as a premature infant with treatment with oxygen >21% for at least 28 days plus after birth to maintain SpO_2 ≥85%,[8] (yes/no), PDA confirmed by echocardiogram after 2 weeks (yes/no) and surfactant use (no/yes). Retinal examination and echocardiogram were performed by experienced ophthalmologists and imaging doctors in Haiphong Children Hospital.

Data Analysis

Descriptive analysis, univariate analysis, and multinomial logistic regression were carried out in the present research. The pesults in categorical measurements were presented in number (%). Chi-square was used to compare two incidences. $P < 0.05$ was used to define statistical significance.

Odd (OR) and 95% CI of OR were calculated to measure the association of a risk factor with ROP using univariate analysis and multinomial logistic regression.

OR = 1: No association

OR <1: Inverse association

OR>1, lying in between 95% CI, lower extreme >1, there was a positive association of a risk factor with ROP.

SPSS software version 22.0 (SPSS Inc., Chicago, IL, USA) was used to analyze data.

Ethics

The study protocol was accepted by Haiphong Children Hospital (No 1039/QĐ-YDHP) and approved by the Scientific Research Ethics Committee (IRB). The mothers of these PI gave informed consent after full explanation of the objectives of the study was provided.

The Incidence of ROP

Some features of participants with ROP

Table 1 shows that ROP affected more boys than girls (62.0% vs. 38.0%), in the gestational age group, ROP affected more PI in 32–34 weeks of GA group than other groups. ROP occurred the most in 1250 –<1750 g group. Most of the participants were born in a rural area, and most of them were born in natural way.

The incidence of ROP

The incidence of ROP was 38.0%, in which 12.3% were classified severely and 25.7% were classified mildly.

There was not a statistically significant difference of ROP incidence between sexes, but we found that there was a statistically significant difference among ROP incidences of

GA, BW, and living places with *P*-value as followed <0.001, <0.01, and <0.05.

Some Associated Factors with ROP

On the univariate analysis model, we found that GA, BW, O_2 dependence ≥14 days, invasive mechanic ventilation, blood transfusion ≥3 times, infection, BPD, and surfactant use were strongly associated with ROP. Other factors, such as sex, SGA, and maternal breastfeeding, were not significantly associated with ROP.

In the final model of multinomial logistic regression, we found that there were only three factors that were still associated with ROP. Among three factors, blood transfusion more than 3 times was inversely associated with ROP. In terms of OR, for GA, we found that it increased from 20.5 to 22.89, and for O_2 dependence, it reduced from 10.5 to 6.85.

Table 1: Some features of participants with retinopathy of prematurity

Sex (*n*=171)	Number (*n*)	Percentage (%)
Males	92	53.8
Females	79	46.2
Gestational age (week) (*n*=171)		
≤28 weeks	7	4.1
29–<32 weeks	59	34.5
32–34 weeks	105	61.4
Birth weight (g) (*n*=171)		
<1250	23	13.5
1250–<1750	95	55.6
≥1750	53	31.0
Delivery method (*n*=171)		
Vaginal birth	94	55.0
Cesarean birth	77	45.0
Causes of preterm birth (*n*=171)		
Provoked	92	53.8
Spontaneous	79	46.2
Living place (*n*=171)		
Urban	58	33.9
Rural	113	66.1

DISCUSSION

The Incidence of ROP in PI

Figure 1 shows that the incidence of ROP in our study was 38.0%, in which 25.7% were mild and 12.3% were moderate.

Chen *et al*. (2015) studied 472 PI with GA <34 and BW <2000 g in China found that the incidence of 15.0% was much lower than that of our incidence.[9] Our incidence of ROP was also higher than that of Denmark (3.0%).[10]

The study of Phan Hong Mai on PI with BW ≤1500 g and GA ≤33 weeks in Ho Chi Minh City showed that ROP affected

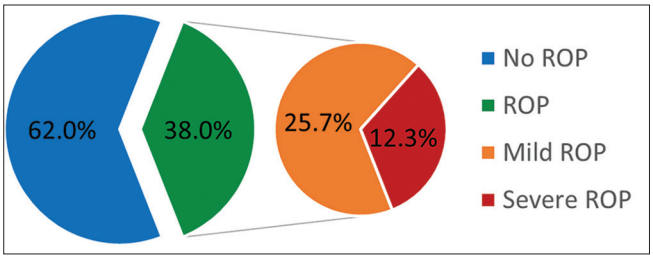

Figure 1: The incidence and severity of retinopathy of prematurity (*n*=171)

Table 2: The incidence of ROP according to some features of PI

Incidence of ROP regarding sex (*n*=171)	Number of studied PI (*n*)	Number of ROP (*n*)	Incidence (%)	*P*
Males	92	38	41.3	>0.05
Females	79	27	34.2	
Prevalence of ROP regarding GA (*n*=171)				
≤28 weeks.	7	7	100.0	<0.001
29–<32 weeks	59	40	67.8	
32–34 weeks	105	18	17.1	
Incidence of ROP regarding BW (g) (*n*=171)				
<1250	23	16	25.0	<0.01
1250–<1750	95	37	31.1	
≥1750	53	12	8.6	
Incidence of ROP regarding living place (*n*=171)				
Urban	58	29	17.3	<0.05
Rural	113	36	15.7	

Table 3: Some associated factors with ROP in univariate analysis

Sex	ROP	OR	95% CI	*P*
Males (*n*=92)	38	1.35	0.73–2.53	>0.05
Females (*n*=79)	27			
Gestational age (weeks)				
<32 weeks (*n*=33)	29	20.5	6.75–62.47	<0.001
≥32 weeks (*n*=138)	36			
Birth weight (g)				
<1750 (*n*=118)	53	2.78	1.33–5.8	<0.01
≥1750 (*n*=53)	12			
O2 dependence ≥14 days				
Yes (*n*=38)	30	10.5	4.39–25.1	<0.001
No (*n*=133)	35			
Invasive mechanic ventilation				
Yes (*n*=33)	30	2.78	1.33–5.8	<0.01
No (*n*=138)	35			
Blood transfusion ≥3 times				
Yes (*n*=40)	23	2.87	1.39–5.93	<0.01
No (*n*=131)	42			
Small for gestational age				
Yes (*n*=49)	13	0.49	0.24–1.007	=0.05
No (*n*=122)	52			
Maternal breastfeeding				
No (*n*=45)	15	0.61	0.3–1.23	>0.05
Yes (*n*=121)	50			
Infection				
Yes (*n*=87)	42	2.47	1.31–4.68	<0.01
No (*n*=84)	23			
Bronchopulmonary dysplasia				
Yes (*n*=14)	13	26.25	3.34–206.15	<0.001
No (*n*=157)	52			
Patent ductus arteriosus				
Yes (*n*=64)	29	1.63	0.87–3.08	>0.05
No (*n*=107)	36			
Surfactant use				
Yes (*n*=64)	35	3.1	1.62–5.92	<0.01
No (*n*=167)	30			

45.8% of them. This incidence was significantly higher than that of our incidence.[11]

Hung carried out a study on 186 PI with BW ≤2000 g and GA <35 weeks in Neonatal Department of Central Hospital of Gynecology and Obstetrics in Hanoi and found that 41.1% of the subjects suffered from ROP.[12]

We recognized that the ROP incidence in our hospital was lower than that of ROP incidence in other countries, but it was as high as ROP incidence in studies done in Vietnam. We thought that PI in studies done in foreign countries did not head with such associated factors in our study, so ROP incidence in those studies was really low.

Table 2 shows that ROP incidence in males was 41.3% and in females was 34.2% and the difference of ROP incidences by sex was not significant ($P > 0.05$). Mutlu *et al*. found that the male/female ratio was 1.03/1[13], and according to Tinh, this ratio was 1.09/1.[14]

According to the American Academy of Pediatrics, PI with BW ≤1500 g or GA ≤30 weeks must be screened for ROP and PI with BW from 1500 g to 2000 g and GA >30 weeks who had associated factors such as hypotension requiring inotropic support need to be carefully examined retina.[15]

ROP incidences according to GA and BW in our study were similar to that of Tinh (2007),[14] Hung (2008),[12] Hoa (2011),[16] and Thanh (2012),[17] as well as cryotherapy for ROP cooperative group.[18]

Some Associated Factors with ROP

In the final model of multinomial logistics regression, OR of PI before 32 weeks' GA increased from 20.5 to 22.89, which meant that GA <32 weeks was a key problem in ROP mechanism. O_2 dependence ≥14 days to maintain SpO_2 more than 90% lead to oxygen toxicity situation in PI, including ROP. This remark was similar to that of Campbell (1951).[19]

In clinics, PI before 32 weeks' GA often suffer from respiratory failure whose causes included hyaline membrane disease, transient tachypnea of the newborn. Due to respiratory failure, PI requires oxygen therapy and invasive mechanic ventilation a long time that creates O_2 dependence in them and develops ROP condition. The longer the O_2 dependence is, the higher the ROP rate. This remark was similar to that of Tinh (2007) and Hung (2008).[12,14] Lala-Gitteau *et al*. (2007) studied 161 PI with BW <1500 g and GA before 32 weeks and found that meantime depended on oxygen in the ROP group was 56.11 ± 6.18 days.[20]

Anemia often affects PI, so these PI need to be transfused more often. The connection of fetal hemoglobin with oxygen is closer than that of adult hemoglobin. Therefore, more frequent blood transfusion increases the oxygen concentration in the retina. This condition causes vasoconstriction and stimulates neovascularization in the retina. Hence, PI being transfused have a high risk of ROP development.[21] In our study, blood transfusion ≥3 times was inversely associated with ROP. Table 4 shows that when the number of blood transfusions increased, the risk of developing ROP in PI decreased 0.22

Table 4: Some associated factors with ROP in multinomial logistic regression

Variables	OR in univariable analysis	95% CI univariable analysis	OR multinomial logistic regression	95% CI multinomial logistic regression
Gestational age (weeks) <32 weeks (*n*=33)	20.5	6.75–62.47	22.89	5.5–95.23
Birth weight (g) <1750 (*n*=118)	2.78	1.33–5.8	1.34	0.55–3.29
O2 dependence ≥14 days Yes (*n*=38)	10.5	4.39–25.1	6.85	1.84–25.56
Invasive mechanic ventilation Yes (*n*=33)	2.78	1.33–5.8	0.75	0.19–2.79
Blood transfusion ≥3 times Yes (*n*=23)	2.87	1.39–5.93	0.22	0.05–0.89
Neonatal infections Yes (*n*=87)	2.47	1.31–4.68	1.27	0.56–2.92
Bronchopulmonary dysplasia Yes (*n*=14)	26.25	3.34–206.15	4.29	0.35–53.23
Surfactant use Yes (*n*=64)	3.1	1.62–5.92	3.1	0.92–10.61

times compared with blood transfusion ≥3 times with 95% CI from 0.05 to 0.89.

CONCLUSION

The incidence of ROP in PI was 38.0%, in which 25.3% were mild and 25.7% severe. ROP was frequently encountered in PI with GA ≤28 weeks (100%), in PI with BW ≤1750 g (94.4%), and in an urban area 17.3%. GA <32 weeks and O_2 dependence more than or equal to 14 days were strongly associated with ROP with OR 22.89 and 6.85, respectively. Blood transfusion more than or equal to 3 times was inversely associated with ROP (OR = 0.22).

RECOMMENDATION

It needs to well-manage pregnancies to reduce the incidence of PI.

In clinics, some neonatal causes of respiratory failure must be made a diagnosis of and treated effectively and in time to reduce the time of O_2 dependence in PI. This can prevent the PI from developing ROP. On the other hand, blood transfusion should be limited as much as possible.

AUTHORS' CONTRIBUTIONS

Authors participated in study design, protocol development and performance, data analysis, interpretation of data and the writing of the manuscript, carried out the clinical data collection and data analysis and read, and approved the final manuscript.

DATA AVAILABILITY

The EXCEL/SPSS data used to support the findings of this study are available from the corresponding author on request.

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COMPETING INTERESTS

The authors declare that they have no competing interests.

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Research Article

The rate of malnutrition in children under 5 years old at the Consultation Department of Haiphong Children Hospital in 2018

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ABSTRACT

Objective: The study was done to describe the rate of malnutrition in children under 5 years old at the Consultation Department of Haiphong Children Hospital in 2018. **Subject and Methods:** Studied subjects included 302 children under 5 years old at the Consultation Department of Haiphong Children Hospital. The sample size was calculated using the incidence of stunting in children under 5 years old of Vietnam and the purpose sampling process was used to select studied subjects. A cross-sectional study was conducted. Malnutrition was estimated by anthropometric measurements. Underweight, stunting, and wasting were defined as Z-score of weight for age Z-score, height for age Z-score, and weight for height Z-score <–2SD, respectively. The severity of malnutrition was based on a threshold from –2 SD to <–3SD (the 1st degree), from –3 SD to <–4 SD (the 2nd degree), and <–4 SD (the 3rd degree). **Results:** The rate of underweight was 11.9%, stunting 17.9%, and wasting 4.3%. Stunting increased gradually from 1 to 2, 3, ad 4 years old and then decreased while underweight and wasting had the highest rate at 1 year old, varied differently at 2, 3, and 4 years old, then decreased at 5 years old. Malnutrition of all kinds was mainly the 1st degree; underweight 94.4%, stunting 90.7%, and wasting 84.6%, respectively. The second degree malnutrition represented a low rate and there was not the 3rd-degree malnutrition. **Conclusions:** Malnutrition was very prevalent in children under 5 years old at the consultation Department of Haiphong Children Hospital. Adequate counseling of nutrition for their parents must be necessarily done to reduce the high rate of malnutrition in the age group.

Keywords: Malnutrition, Rate, Stunting, Underweight, Wasting

INTRODUCTION

Malnutrition in children under 5 years old is a very common condition in developing countries, including Vietnam. According to the UNICEF in 2013, there were 165 million accounting for 26% of the total children under 5 years old all over the world suffering from stunting in 2011.[16] While analyzing the nutritional challenges in children in 2013, the WHO said that in 2011 there were 6.9 million of deaths in children under 5 years old, and malnutrition played the direct and inderect role in 35% of these deaths.[13] Data from the National Institute of Nutrition of Vietnam showed that in 2015, one of 7 children under 5 years old was malnourished, and one of 4 children in this age group was stunted.[8] In 2017, in Vietnam, the incidence of underweight and stunting in children under 5 years old was 13.8% and 24.3%, respectively.[6]

In the past decade, Vietnam gained great achievement in fighting against malnutrition in children under 5 years old, particularly stunted malnutrition, but the incidence of stunting was in average compared to the classification of malnutrition of the WHO.[7]

Up to now, malnutrition has been estimated by basing on community. A question raised if children who are examined at the consultation department and are not hospitalized are malnourished. Haiphong Children Hospital that is a specialty setting examines on average 70.000 patients/year. Therefore, a study on the malnutrition status of these patients is really necessary.

SUBJECTS AND METHODS

Research Design

A cross-sectional study was performed.

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Studied Subjects

Studied subjects included 302 children under 5 years old and their mother or father during studying time (March 01, 2018–June 30, 2018), consulting at Haiphong Children Hospital. The sample size was calculated based on the national stunting rate among children under 5 years old in Vietnam (24.9%).[7] Subjects were selected into the study by purpose sampling process on working days of the week except for the weekend from 8:00 AM to 12:00 AM.

Inclusion/Exclusion Criteria

To participate in the study, studied subjects had to be <5 years old and their mothers or fathers agreed to participate in. Studied subjects with comorbidities such as a neurologic, digestive, and cardiovascular diseases that might bias the results were excluded from the study.

Data Collection Procedures

General information

Demographic data were collected by interviewing the parents or thoroughly studying the patients' medical record. The age of children was calculated based on the WHO definition.[12]

Measurement/definitions

Weight: An automatic weight scale (SECA-769) with a precision of ±10 g was used to measure the body weight of the patients. The scale was calibrated at the time of each measurement.

Length/height: Length of children under 2 years of age was measured in a recumbent position using a wood scale (set-square tool) with a precision of ±0.1 cm. Over 2 years old children's height was measured using a Microtoise height scale with a precision of ±0.1 cm.

Categorization into underweight, stunting, and wasting groups was based on the WHO criteria, with cutoff below –2 SD.[12]

Severity of malnutrition was defined as Z-score of weight for age Z-score, height for age Z-score, and weight for height Z-score <–2SD–<–3 SD (1st degree), –3SD–<–4SD (2nd degree), and <–4SD (3rd degree).

Data Analyses

All anthropometric Z-scores parameters were calculated using the WHO Anthro software 2006.[12] Chi-squares were used to compared rates (SPSS software version 22.0 Inc, Chicago, IL, USA). A $P < 0.05$ was defined as being statistically significant.

Ethical Considerations

The protocol was accepted by the Scientific Research Ethics Committee of Haiphong Children Hospital (No 1236/QĐ-YDHP). Parents or legal guardians of the children gave their informed consent after having received a full explanation of the objectives of the study.

RESULTS

General Information about Studied Subjects

Among 302 studied subjects, boys represented 59.9%, subjects in 12–<24-month-old group had the highest rate 27.2% and subjects in 48–<60-month-old group had the lowest rate 13.9%. Subjects from the urban area were 38.7% and subjects from the rural area were 61.3%.

The Rate of Malnutrition

The rate of underweight

The underweight rate was 11.9%. The rate of underweight was not statistically different by sex and by age group.

The rate of stunting

The rate of stunting was 17.9%. The rate of stunting was not statistically different by sex and by age group.

The rate of wasting

The rate of wasting was 3.3%. The rate of wasting was not statistically different by sex and by age group.

The severity of malnutrition

Most underweight was the 1st degree, there was not the 3rd degree underweight. The severity of underweight was not statistically deferent by sex and by age group.

The majority of stunting were the 1st degree (16.2%), there was not the 3rd-degree stunting. The severity of stunting was not statistically deferent by sex and by age group.

The majority of wasting were the 1st degree (3.6%), there was not the 3rd-degree wasting. The severity of wasting was not statistically deferent by sex and by age group.

Table 1: Demographic characteristics of studied subjects

Characteristics	(*n*)	(%)
Sex (*n*=302)		
Boys	181	59.9
Girls	121	40.1
Agegroup (*n*=302)		
<12 ms	46	15.2
12–<24 ms	82	27.2
24–<36 ms	63	20.8
36–<48 ms	69	22.8
48–<60 ms	42	14.0
Living place (*n*=302)		
Urban	116	38.4
Rural	186	61.6

DISCUSSIONS

The Rate of Underweight and its Severity

The child's weight that is a mirror reflects his nutritional status at the studying moment. Table 2 showed that the rate of underweight in our study was 11.9%, classified on an average level according to the malnutrition categorization of the WHO.[14] Among these malnourished children, the first degree represented 11.2%, and the remain were the second degree [Table 5]. We did not meet any case in the 3rd degree. Compared to the national rate of underweight (13.8%) in 2016, this rate was lower (1.9%).[6]

In terms of underweight severity, we found our results were very similar to that of Minh in 2013;[5] the 1st degree was 10.8% and the 2nd degree was 1.4%.

Table 5 also showed that the 1st degree underweight affected 94.7% of boys and 94.1% girls. This remark was similar to that of Minh[5] and Thu *et al*.[15] In contrast, In Pakistan, girls were more likely to be malnourished than boys.[4]

The 1st degree underweight affected most age groups, particularly the age group of 36–<48 ms (38.2%). Although the 1st degree underweight affected all age groups, it had a tendency to increase in 3, 4 years old. This conclusion resembled to that of Chien,[11] Minh.[5]

The Rate of Stunting and its Severity

The overall rate of stunting in children under 5 years old at the consultation Department of Haiphong Children Hospital was 17.9%, comparing to that of malnutrition categorization of the WHO[14] [Table 3]. This rate was much lower than that of the national rate in 2016 (24.3%).[6] This rate was also lower than that of Minh in 2013 (20.7%),[5] and of Tharparkar in Pakistan in 2017 (41%).[4] However, our rate was much higher than that of Chien in 2007 (12%)[11] and similar to that of Hung in 2013 (19.7%).[9]

In terms of severity of stunting, Table 6 showed that the 1st-degree stunting was 16.1% and the 2nd-degree stunting was 1.7%. We did not find any case of the 3rd-degree stunting. Our result was suitable to that of Minh;[5] the 1st-degree stunting 19.1% and the 2nd-degree stunting 1.6%. According to the sex, we found that in the 1st degree, stunting affected more girls than boys (57.1% vs. 42.9%), and in the 2nd-degree, stunting affected more boys than girls (60.0% vs. 40.0%). In Ghana, Darteh *et al*.[2] and in Bangladesh, Ahmed *et al*.[1] found stunting affected more boys than girls.

The rate of stunting varied differently in deferent age groups. However, it had a tendency to reduce in the age of 5. This rate of stunting was highest in the age of 3 and 4 (17.5%

Table 2: The rate of underweight regarding sex and age group

	Studied subject number (*n*)	Underweight number (*n*)	(%)	*P*
Sex				
Boys	181	19	10.5	>0.05
Girls	121	17	14.0	
Total	302	36	11.9	
Age group				
<12 ms	46	6	13.0	>0.05
12–<24 ms	82	4	4.9	
24–<36 ms	63	7	11.1	
36–<48 ms	69	14	20.3	
48–<60 ms	42	5	11.9	
Total	302	36	11.9	

Table 3: The rate of stunting regarding sex and age group

	Studied subject number (*n*)	Stunting number (*n*)	(%)	*P*
Sex				
Boys	181	31	17.1	>0.05
Girls	121	23	19.0	
Total	302	54	17.9	
Age group				
<12 ms	46	7	15.2	>0.05
12–<24 ms	82	13	15.9	
24–<36 ms	63	11	17.5	
36–<48 ms	69	18	26.1	
48-<60 ms	42	5	11.9	
Total	302	54	17.9	

Table 4: The rate of wasting regarding sex and age group

	Studied subject number (*n*)	Wasting number (*n*)	(%)	*P*
Sex				
Boys	181	6	3.3	>0.05
Girls	121	7	5.8	
Total	302	13	4.3	
Age group				
<12 ms	46	3	6.5	>0.05
12–<24 ms	82	2	2.4	
24–<36 ms	63	3	4.8	
36–<48 ms	69	4	5.8	
48–<60 ms	42	1	2.4	
Total	302	13	4.3	

Table 5: The severity of underweight according to the sex and age group

	1st degree			2nd degree		
	(*n*)	Row (%)	Column (%)	(*n*)	Row (%)	Column (%)
Sex						
Boys	18	94.7	56.9	1	5.3	50.0
Girls	16	94.1	47.1	1	5.9	50.0
Total	34	11.2	100.0	2	0.7	100.0
P		>0.05			>0.05	
Age group						
<12 ms	5	83.3	14.7	1	16.7	50.0
12–<24 ms	4	100.0	11.8	0	0.0	0.0
24–<36 ms	7	100.0	20.6	0	0.0	0.0
36–<48 ms	13	92.9	38.2	1	7.1	50.0
48–<60 ms	5	100.0	14.7	0	0.0	0.0
Total	34	11.2	100.0	2	0.7	100
P		>0.05			>0.05	

Table 6: The severity of stunting according to the sex and age group

	1st degree			2nd degree		
	(*n*)	Row (%)	Column (%)	(*n*)	Row (%)	Column (%)
Boys	28	90.3	57.1	3	9.7	60.0
Girls	21	91.3	42.9	2	8.7	40.0
Total	49	16.2	100.0	5	1.7	100.0
P		p>0.05			>0.05	
Age group						
<12 ms	7	100.0	14.3	0	0.0	0.0
12–<24 ms	11	84.6	22.4	2	15.4	40.0
24–<36 ms	11	100.0	22.4	0	0.0	0.0
36–<48 ms	16	88.9	32.7	2	11.1	40.0
48–<60 ms	4	80.0	8.2	1	20.0	20.0
Total	49	16.2	100.0	5	1.7	100.0
P		> 0.05			> 0.05	

Table 7: The severity of wasting according to the sex and age group

	1st degree			2nd degree		
	(*n*)	Row (%)	Column (%)	(*n*)	Row (%)	Column (%)
Boys	5	83.3	45.5	1	16.7	50.0
Girls	6	85.7	54.5	1	14.3	50.0
Total	11	3.6	100.0	2	0.7	100.0
P		>0.05			>0.05	
Age group						
<12 ms	2	66.7	18.2	1	33.3	50.0
12–<24 ms	2	100.0	18.2	0	0.0	0.0
24–<36 ms	2	66.7	18.2	1	33.3	50.0
36–<48 ms	4	100.0	36.4	0	0.0	0.0
48–<60 ms	1	100.0	9.0	0	0.0	0.0
Total	11	3.6	100.0	2	0.7	100.0
P		> 0.05			> 0.05	

and 26.1, respectively). Our remark was similar to that of El Taguri *et al*.[3] The stunting rate was highest in the age of 2–4.

The Rate of Wasting and its Severity

The common rate of wasting was 4.3%, classified in a low level of malnutrition according to the malnutrition categorization of the WHO[14] [Table 4]. Our rate of wasting was much lower than that of children under 5 years old in An Duong District in 2011 (7.3%),[10] and this rate of wasting was also lower than that in children <5 years old in the whole city of Haiphong 2016 (5.4%).[8]

According to the severity of wasting [Table 7], we found that the 1st degree of wasting dominated in the age of 4 and 5. In this age group, children had to go to Kindergarten, where they were able to suffer some acute respiratory infection, acute diarrhea that makes them malnourished. Similar to underweight and stunting, we just found the 1st and the 2nd degree of wasting and this result resembled to that of Minh[5] the 1st degree (4.8%) and the 2nd degree (0.7%).

CONCLUSIONS

The rate of underweight, stunting, and wasting in children under 5 years old who were examined at the consultation Department of Haiphong Children Hospital was 11.9%, 17.9%, and 4.3%, respectively.

Stunting increased from 1 year old then 2, 3 years old, and from 4 years old it gradually decreased while underweight, wasting had the highest rate at 1 year old, varied differently at 2, 3, and 4 years old and then decreased at 5 years old.

Malnutrition was classified the 1st degree (94.4% of underweight, 90.7% of stunting, and 84.6% of wasting). The 2nd degree of malnutrition accounted for a low rate and there was not the 3rd degree of malnutrition of all categories.

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Research Article

Nutritional status of children with thalassemia at Haiphong Children Hospital in 2019

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ABSTRACT

Objective: The study aimed at estimating the nutritional status of children with thalassemia (Thal) at the Hematology Department of Haiphong Children Hospital from January 01, 2019 to June 30, 2019. **Subjects and Methods:** A cross-sectional study was performed. Cases consisted of Thal patients aged from 3 months to <15 years. The diagnosis was based on clinical signs, i.e., anemia, jaundice, and splenomegaly, as well as hemoglobin (Hb) electrophoresis. Children were categorized in one of the three following groups: Underweight, normal, and overweight. The nutritional status of under 60-month children was evaluated by anthropometry. A threshold of –2 SD at Z-scores of weight for age Z-score, height for age Z-score, and weight for height Z-score were used to define underweight, stunting, and wasting, respectively. In patients, ≥60 months age, BMI (weight [kg]/height^2 [m]) norms for Asians were used with a threshold for wasting at <18.5 and a threshold of overweight at 25.0. Anemia was defined as a Hb concentration (g/L) <110. T-tests were used to compare means. Chi-squares were used to compare rates. We considered groups differed when $P < 0.05$. Blood analysis was done in the Laboratory Center of Haiphong Children Hospital. **Results:** The rate of stunting (chronic malnutrition) was 26.9% and the rate of wasting (acute malnutrition) was 7.7%. There were no underweight patients among the <60 months of age. In ≥60 month children, the rate of overweight/obesity was 42.9% and the rate of wasting was 14.3%. Sixty-one patients (100%) had anemia. **Conclusions:** Stunting (chronic malnutrition) was a common malnutrition sign in Thal patients <60 months (26.9%) more than wasting (acute malnutrition) 7.7%. Meanwhile, in ≥60-month children, overweight/obesity was prevalent at a higher rate (42.9%) than wasting's (14.3%). All studies patients suffered from chronic anemia.

Keywords: Anemia, Malnutrition, Overweight/obesity, Rate, Stunting, Thalassemia, Underweight, Wasting

INTRODUCTION

Malnutrition is a common health condition in children under 5, a direct or indirect cause of mortality in this age group. In Vietnam, malnutrition in children under 5 is a public health priority. Malnutrition is also an indicator reflecting the socioeconomic development of the country.

According to the WHO,[1] the worldwide rate stunting decreased from 29.5% to 22.9% between 2005 and 2016. Yet, there are still 155 million children suffering from stunting.[2]

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The UNICEF's report (2016) reveals that half of the deaths in under 5-year-old children is caused by malnutrition.[3]

Nowadays, severe malnutrition is no longer found in clinics. However, it is still encountered in some particular cases such as in thalassemia (Thal) patients.

Thal is an inherited hemoglobin (Hb) disorder influencing the physical development of patients. In our hospital, there has been a study done about the life quality of thal patients.[4] However, no study about the nutritional status of these patients has yet been performed.

Thal patients' appearance suggests growth development delay, as they tend to be below height averages. Is this impression correct? The question remains open, as the

nutritional status of these patients has never been assessed in our hospital.

SUBJECTS AND METHODS

Research Design

A cross-sectional study was performed.

Studied Subjects

Research subjects included 61 Thal patients aged from 3 months to <15 years old and their mother or father during studying time (January 01, 2019–June 30, 2019), who consulted at Haiphong Children Hospital. Patients were selected into the study by the purpose sampling process.

Inclusion/Exclusion Criteria

To participate to the study, patients had to be <15 years old and have received a diagnosis of any type of Thal (alpha/beta Thal). Patients were excluded if their parents did not agree to participate in the study or if they had comorbidities such as neurologic, digestive, and cardiovascular diseases that might bias the results.

Data Collection Procedures

General information

Demographic data were collected by interviewing the parents or thoroughly studying the patients' medical record. The age of children was calculated based on the WHO definition.[5]

Measurement

Weight: An automatic weight scale (SECA-769) with a precision of ±10 g was used to measure the body weight of the patients. The scale was calibrated at the time of each measurement.

Length/height: Length of children under 2 years of age was measured in a recumbent position using a wood scale (set-square tool) with a precision of ±0.1 cm. Over 2-year-old children's height was measured using a Microtoise height scale with a precision of ±0.1 cm.

Blood analysis was daily done, once patients were clinically diagnosed thal. Blood samples were analyzed in the Laboratory Center of Haiphong Children Hospital.

Definitions

Categorization into underweight, stunted, and wasting groups were based on the WHO criteria, with cutoff below –2 SD.[5]

Underweight, stunting, and wasting were defined as Z-scores of weight for age Z-score (WAZ), height for age Z-score (HAZ), and weight for height Z-score (WHZ) <–2 SD.

Overweight and obesity were defined as weight (kg)/(height)^2 (m) (BMI) ≥ +2 SD. The formula for BMI was weight (kg)/height^2 (m). Wasting was defined as a BMI <18.5; overweight/obesity was defined as a BMI ≥25.0.

Anemia was defined as serum Hb concentration <110 g/L.[6]

Data Analyses

All anthropometric Z-scores parameters were calculated using the WHO Anthro software 2006.[5] Continuous data were described by means and standard deviations. Continuous data were compared with student *t*-tests using SPSS software version 22.0 (SPSS Inc., Chicago, IL, USA). $P < 0.05$ was defined as being statistically significant.

Blood analyses were done at the Laboratory Center, Haiphong Children Hospital.

Table 1: Some common features of subjects

Characteristics	(*n*)	(%)	Mean±SD
Number of patients	61		
Sex (boy)	32	52.5	
Subjects' mean age (months)	61		77.1±41.7
<60	26		38.35±13.5
≥60	35		105.89±30.6
Weight (kg)			
<60 ms	26		13.70±2.89
≥60 ms	35		23.81±6.06
Height (cm)			
<60 ms	26		91.38±11.1
≥60 ms	35		123.77±11.4
Z-score (<60 ms)			
WAZ	26		–0.48±0.81
HAZ	26		–1.00±1.68
WHZ	26		0.25±1.44
BMI (≥60 ms)	35		23.8±6.06
Hb (g/L)			
<60 ms	26		93.57±23.89
≥60 ms	35		78.04±11.20
Living place (*n*=61)			
Urban	16	26.2	
Rural	40	65.6	
Else	5	8.2	
Age of thalassemia diagnosis (***n***=61)			
<12 m	19	31.1	
12–<60 m	34	55.7	
≥60 m	8	13.1	
Type of thal (*n*=61)			
Beta thal	49	80.3	
Alpha thal	12	19.7	

Ethical Considerations

The protocol was accepted by the Scientific Research Ethics Committee of Haiphong Children Hospital (No 1227/QĐ-YDHP). Parents or legal guardians of the children gave their informed consent after having received a full explanation of the objectives of the study.

RESULTS

Thal affected more males (52.2%) than females (47.5%). Half of the children (57.4%) were ≥60 months old. There were very few <12 months old (1.6%). Most subjects came from the rural area. The majority of subjects were diagnosed at an age between 12 and <60 months (55.7%). Beta thal was the most frequently encountered thal type (80.3%).

We did not find any difference between sexes in terms of mean WAZ, mean HAZ, mean WHZ, and mean Hg (g/L). Similarly, mean BMI did not significantly differ between sexes.

Mean WAZ, mean HAZ, mean WHZ, and mean Hg (g/L) were not significantly different between age groups in under 60-month-old children with thal.

The rate of stunting was 26.9%, while the rate of wasting was 7.7%. There were not underweight <60-month-old children. In patients ≥60 months, the rate of overweight/obesity was 42.9%, while the rate of wasting was 14.3%. All thal patients in both age groups had anemia (100%).

Remarks.

Five of the seven malnourished patients, 13 of the 15 overweight patients, and four of the five wasted patients had a beta thal. Among 61 patients with anemia, 49 were classified as having a beta thal.

DISCUSSION

Rate of Malnutrition in Thal Patients <60 Months

Tables 2 and 3 show that the Z-score of WAZ, HAZ, and WHZ, according to sexes and age groups in patients <60 months, was not significantly different. Therefore, overweight, stunting, and wasting affected both sexes and all age groups in patients <60 months.

Table 4 shows that patients <60 months only suffered from 2 types of malnutrition that were chronic and acute malnutrition. The rate of stunting (chronic malnutrition) was 26.9%, while the rate of wasting (acute malnutrition) was 7.7%. The stunting rate in the study (23.5%) was slightly higher than that revealed at the national level (24.6%);[7] whereas, underweight rate (14.1%) was much lower than the rate at the national level, as reported in 2015 (14.1%).[7]

Table 2: Distribution of subjects' WAZ, HAZ, and WHZ scores, BMI, and Hb level according to the sex

Characteristics	Number	Mean±SD	*P*-value (2-tailed)
WAZ*	26		
Boy	13	–0.64±0.79	>0.05
Girl	13	–0.32±0.83	
HAZ*	26		
Boy	13	–0.99±1.31	>0.05
Girl	13	–1.02±2.05	
WHZ*	26		
Boy	13	0.12±0.92	>0.05
Girl	13	0.37±1.84	
Hb (g/L)*	26		
Boy	13	91.57±23.64	>0.05
Girl	13	95.57±24.93	
BMI*			
Boy	19	22.47±4.87	>0.05
Girl	16	25.41±7.07	

*Student *t*-test

Table 3: Distribution of subjects' WAZ, HAZ, and WHZ, and Hb level according to the age group

Characteristics	Number	Mean±SD	*P*-value (2-tailed)
WAZ*	26		
3–<24 ms	4	–0.93±0.54	>0.05
24–<36 ms	5	–0.31±1.17	
36–<48 ms	12	–0.34±0.67	
48–<60 ms	5	–0.62±0.98	
HAZ*	26		
3–<24 ms	4	–1.53±0.66	>0.05
24–<36 ms	5	0.09±2.97	
36–<48 ms	12	–1.28±1.43	
48–<60 ms	5	–1.05±0.99	
WHZ*	26		
3–<24 ms	4	–0.05±1.10	>0.05
24–<36 ms	5	–0.16±2.19	
36–<48 ms	12	0.62±1.48	
48–<60 ms	5	0.03±0.63	
Hb (g/L)*	26		
3–<24 ms	3	84.05±16.58	>0.05
24–<36 ms	5	94.88±29.55	
36–<48 ms	12	103.74±22.43	
48–<60 ms	5	75.12±16.82	

*Student *t*-test

A very bad nutritional status in thal patients <60 ms was not really correct because stunting was not much higher than that

Table 4: Rate of malnutrition, anemia, wasting, and overweight/obesity

Nutritional status	Investigated subjects (*n*)	Number of case (*n*)	Percentage
Underweight	26	0	0.0
Stunting	26	7	26.9
Wasting	26	2	7.7
Overweight/obesity	35	15	42.9
Wasting	35	5	14.3
Anemia	61	61	100.0

Table 5: Stunting, overweight/obesity, and wasting according to the type of thalassemia

Type of thalassemia	Beta thalassemia (*n*)	Alpha thalassemia (*n*)	Total
Stunting (*n*=7)	5	2	7
Overweight/obesity (*n*=15)	13	2	15
Wasting (*n*=5)	4	1	5
Anemia (*n*=61)	49	12	61

of the national level of stunting while wasting was much lower than that of the national rate of wasting.

In Vietnam, we have not had research on the nutritional status in thal patients. However, in Pakistan, Moiz *et al*.[8] have investigated malnutrition in transfusion-dependent thal patients with the use of anthropometric measurements. They found that Z-score of HAZ was as low as –2.69 and ranged from –1.46 to –3.8. As a result, 65.4% of patients in this study were clinically stunted. Moreover, the author found that stunting began at the age of 5–10 years and increased substantially overtime.

In Thailand, Thongkijpreecha *et al*.[9] found that thal intermedia aged between 5 and 15 years had their growth impaired. Saxena[10] revealed that among 90 thal major patients aged 2–18 years, the average height was lower than the mean height of children from the same age group. Moreover, the speed of growth and BMI was lower compared to non-thal children. Furthermore, the authors discovered that the retardation of growth started quite early when patients were 8 years of age.

In studies done on hospitalized patients without thal, Huynh *et al*. found that 9.8% of patients were stunted and 8.4% underweighted.[11] In Malaysia, a study performed in 2013 on 285 patients aged between 3 months and 15 years[12] found that acute malnutrition affected 11% of the children and chronic malnutrition 14%. According to Merchant *et al*.,[13] 57.14% of thal patients who were transfused suffered from stunting.

Rate of Wasting, Overweight/Obesity

Based on BMI, 42.9% of ≥60-month-old patients were classified in the overweight/obesity category and 14.3% in the wasting category.

While studying the nutritional status of hospitalized patients without thal in an emergency department, Quadros *et al*.[14] found that the mean BMI of patients ≤60 months of age was reduced 0.145 ± 0.73 and patients aged more than 60 months, mean BMI decreased 0.152 ± 0.39. In Malaysia, 15% of the patients had a BMI <–2SD and 17% of patients were considered as wasted. Huynh *et al*. found 25.8% patients to be overweight.[11]

In thal patients aged more than or equal to 60 months, we found a high incidence of overweight/obesity that was contrary to malnutrition law. This can be explained by a number of stunting in thal patients <60 months becoming overweight/obese when they step into the more than 60 month age group. Stunting might be an independent risk factor of overweight/obesity.

The study of Theodoridis *et al*.[15] in thal patients aged between 8 and 29 years indicated that 8% of these patients were stunted. Twelve percent of male patients and 15% of female patients without endocrinopathies had a height <3rd percentile. Similarly, the study of Yesilipek *et al*.[16] also found that 32.24% of transfusion-dependent thal patients had a height below the 3rd centile. In transfusion-dependent thal patients aged between 5 and 15 years, Moiz *et al*. found that 65.4% were stunted.[8]

In general, in children ≥60 months, overweight/obesity and wasting status depended much on the way they were calculated by BMI or by WHZ Z-score.

The Rate of Anemia

Anemia is a clinical symptom of thal patients and a cause of malnutrition in these patients. However, studies done showed that the rates of anemia in thal patients were completely different.

The study of Tsang *et al*.[17] found that 82.3% of alpha thal patients had anemia. The rate of anemia in hospitalized patients without thal was 30.8% in some district hospitals in Ho Chi Minh City.[11]

CONCLUSION

Chronic and acute malnutrition was widespread in thal patients <60 months of age. However, there was not underweight malnutrition. In patients more than or equal to 60 months of age, overweight/obesity was more frequently encountered than wasting. Anemia affected all patients participating to the study.

Recommendations

Some nutritional interventions should be done in very young patients (<60 months) to limit stunting malnutrition that can lead to overweight/obesity in older patients (≥ 60 months).

AUTHORS' CONTRIBUTIONS

Authors participated in different levels of the study such as study design, protocol development and performance, inspection, data analysis, and article writing.

COMPETING INTERESTS

The authors declare that they have no competing interests.

DATA AVAILABILITY

The EXCEL/SPSS data used to support the findings of this study are available from the corresponding author upon request.

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Research Article

Current situation and the causes affecting the general physical strength of Danang University students

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ABSTRACT

Using the tests prescribed on the assessment and grading of students' physical strength, the Ministry of Education and Training's assessment of the general physical strength condition of 1650 students of Danang University in 3 years from 2015 to 2017, and based on regular research methods to figure out the main reason affecting the physical strength of students is because that the content of the training program has not fully met the requirements.

Keywords: Da Nang University, Faculty of Physical Education, General physical strength, Students

INTRODUCTION

Physical strength development for students in universities, colleges, and secondary technical schools plays a crucial role in education and training. The University of Danang is a multidisciplinary institution with 11 affiliated institutions, with an annual new enrollment target of nearly 13,000 students, so the task of physical education (PE) for students is one of the key tasks, which contributes to the comprehensive education for students. However, following the physical strength changes of students in the better part of last several years, we have found that the rate of students that reached the target is still low, which has a significant impact on the goals of PE. Therefore, assessing the situation and finding the causes affecting the physical strength of students to timely propose appropriate solutions is an urgent task of the Faculty of PE in this contemporary life.

RESEARCH METHODOLOGY

During the research process, we have used the following methods: Analyzing and synthesizing documents methods, pedagogical observation methods, seminar interview methods, pedagogical testing methods, and statistical and mathematical methods. In which pedagogical testing methods used 4/6 tests specified in Decision No. 53/2008/QD-BGDDT of the Ministry of Education and Training.

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RESEARCH RESULT

The General Physical Strength Condition of Students at the University of Danang

To assess the general physical strength condition of students at the University of Danang, we have placed the reliance on the annual test results stored at the Faculty of PE of the University of Danang for 3 years from 2015 to 2017. Time to evaluate is at the end of the Second PE Program. The age of the unified subjects is 19 years old.

To select a reliable sample size, we conducted a survey for 3 years from 2015 to 2017. With the University's 1st year total students, we randomly selected between 8500 boys and 4500 girls each year. Each school has 50 representative samples, including 25 male students and 25 female students. The total number of subjects assessed was 50 students ×3 years ×11 schools = 1650 samples.

In general, the statistical results over the period of 3-year demonstrate that those students still have not met the requirements of physical strength after 1 year of studying PE. This has been reflected in the following characteristics:

If compare the average of student achievement of the whole school through 3 years of 2015, 2016, and 2017, it shows

that the level of satisfactory is much lower than the level of unsatisfactory. Only 8/24 criteria achieved compared to 16/24 criteria unachieved.

If compare each year according to the qualities, at most each year, the physical strength of students has only 1–2 satisfactory qualities.

If compare between 2 men and women in 3 years, there is a vast distinction with the number of satisfactory qualities of men are 6/12 while women are 2/12.

If compare according to the rate of students meeting the requirements, we can see that the rate is very low and there are irregular changes from year to year, ranging from 35.09% to 52.91% of students that have met the physical strength standards each year.

In terms of quality, all qualities of students after 1 year of study are all not good, with the number of students who met the criteria for each quality is still very modest (<53%). In addition, the quality of endurance has the lowest percentage of students that met the requirements.

Table 1: The general physical strength condition of freshmen at the University of Danang (*n*=1650)

Indicators	Object	Result $\overline{X} \pm \delta$	Standard		Comparison between $\overline{X}$ and standard	Number of students that reached the standard	Proportion %
			Good	Reached			
Standing long jump (cm)	Male						
	2015 (*n*=550)	210±18.5	>225	≥207	Reached	270	49.09
	2016 (*n*=550)	19.3±28.4			Unreached	266	48.36
	2017 (*n*=550)	20.7±19.1			Reached	281	51.09
	Female						
	2015 (*n*=550)	14.2±13.5	>168	≥151	Unreached	238	43.27
	2016 (*n*=550)	13.6±14.1			Unreached	247	44.91
	2017 (*n*=550)	14.8±14.7			Unreached	239	43.45
30 m run (s)	Male						
	2015 (*n*=550)	5.6±0.7	<4.70	≤5.70	Reached	283	51.45
	2016 (*n*=550)	5.5±0.8			Reached	291	52.91
	2017 (*n*=550)	6.4±0.8			Unreached	258	46.91
	Female						
	2015 (*n*=550)	6.9±0.6	<5.8	≤6.8	Unreached	231	42.00
	2016 (*n*=550)	6.7±0.7			Reached	269	48.91
	2017 (*n*=550)	7.2±0.6			Unreached	235	42.73
Shuttle run 4×10 m (s)	Male						
	2015 (*n*=550)	12.3±1.4	<11.75	≤12.40	Reached	277	50.36
	2016 (*n*=550)	12.7±1.6			Unreached	261	47.45
	2017 (*n*=550)	12.2±1.7			Reached	283	51.45
	Female						
	2015 (*n*=550)	13.6±1.1	<12.1	≤13.1	Unreached	249	45.27
	2016 (*n*=550)	13.8±1.5			Unreached	235	42.73
	2017 (*n*=550)	12.9±1.6			Reached	272	49.45
5 min run (s)	Male						
	2015 (*n*=550)	82.3±87.4	>1060	≥950	Unreached	240	43.64
	2016 (*n*=550)	83.4±91.8			Unreached	252	45.82
	2017 (*n*=550)	82.1±78.9			Unreached	239	43.45
	Female						
	2015 (*n*=550)	71.3±87.4	>930	≥850	Unreached	193	35.09
	2016 (*n*=550)	71.6±92.6			Unreached	204	37.09
	2017 (*n*=550)	72.0±97.3			Unreached	211	38.36

As such, it can be witnessed that the effectiveness of the 1st year education program at the University of Danang has not really satisfied the requirements of improving the physical strength for students.

Causes Affecting the General Physical Strength of Students at the University of Danang

To find out the cause, we evaluate the following five aspects:

Evaluating the current situation of PE program

The PE program in Da Nang University (UDN) consists of 4 credits (120 class periods) divided into 4 modules, in which 2 compulsory education modules and 2 elective compulsory modules. Each module has 30 class periods, corresponding to 2 PE lessons per week.

As such, it can be witnessed that the amount of time of formal learning for students is relatively small, mainly devoted to the practice of movement techniques (85%), theory (8.3%), so the program can only help to equip students with the skills for performing some sports techniques at a simple level, which is not enough to form the necessary skills and techniques, which is also one of the reasons leading to the results of the physical strength test of students are not high.

Actual state of facilities at the University of Danang

The state of facilities is ultimately important in the content's choices of teaching subjects for PE for students, and also greatly affects the quality of student training. The statistical results demonstrate that the state of facilities of the schools is similar, the number of playgrounds and equipment is sufficient to implement the contents of the curriculum, though not really

Table 2: Actual situation of extracurricular activities of Danang University students (*n*=550)

Content	Interview results	
	Agree	Rate %
According to you, the current physical education program of the school has met the requirements of physical development and physical strength for students?		
Has met	265	48.2
Not yet	285	51.8
Do you participate in extracurricular physical activities after the mainstream physical education activities at school?		
Yes	183	33.3
No	367	66.7
(Section for people who do not participate in extracurricular physical training activities)		
The reasons why did not you go to extracurricular practice, you could choose various answers		
Do not like exercise	25	6.8
Health has not met movement	8	2.2
Busy to do other works	169	46.0
There is no appropriate sports activity content	254	69.2
Infrastructure has not met the requirement	32	8.7
Busy to study cultural subjects	38	10.4
Do not have a friend to practice with	12	3.3
This section for people participating in extracurricular physical training activities		
Purpose of participating in extracurricular physical training and sport activities?		
Strengthen health	56	30.6
Supplement to the mainstream physical education program	84	45.9
Mandatory extracurricular activities of physical training and sports	0	0.0
Reduce stress, gain entertainment	75	41.1
Beautify your shapes	67	36.6
Making friends	30	16.4
Expectations when practicing extracurricular sports		
There is the content of the appropriate exercise program	183	100
Guaranteed facilities	183	100
Training instructors	183	100

perfect because the quality and quantity are not appropriate, but basically has met the conditions for teaching PE for students in UDN.

Actual situation of PE lectures in Da Nang University

The teaching staffs have directly affected the quality of teaching. To figure out this problem, we have conducted statistics. The results showed that in the past 3 years, the number of lecturers in the Faculty of PE has always been relatively stable at 30–33 people, 100% of them are lecturers and main lecturers, with no senior lecturers. In which each year, the number of lectures increases from 1 to 2 people, the squad is increasingly rejuvenated and the number of years of work distributed relatively with successive generations. It can be witnessed that the teaching staff fully have met the teaching requirements for students.

Current situation of consciousness of Da Nang University students about PE activities

The action of students that actively participate in any of these activities must first come from their consciousness. To find out, we interviewed 550 students, including 275 male and 275 female students, from 11 member universities after finishing PE training 2. The results showed that the consciousness of Da Nang University students on the subject of PE training was very correct and understood the purpose of the course and also the benefits of the subject for themselves, reflected in 100% of the students that the subject of compulsory education improve health, form and develop motor skills, team spirit, collective sense for learners, and also help individuals express themselves in front of people around them. About 97.1% of students regularly participate in studying to ensure that they are eligible for the exam, of which 34.7% prefer or super prefer to study the PE training. However, when self-assessment of physical strength, only 33.7% of them said that their physical strength is from good to very good, up to 55.5% only rated average physical strength, and 11.8% self-rated weak physical strength.

Actual situation of extracurricular sports activities of Danang University students

The physical strength of students does not only depend on the regular curriculum because each semester has only 30 periods of PE, the main program only provides basic knowledge and skills for students to practice during extracurricular hours. Therefore, extracurricular hours are particularly important to improve the physical strength of students. To find out how extracurricular students at Da Nang work, we continue to interview 550 students at the same time with cognitive assessment interviews. The following results:

Interview results have relatively large dispersion in the answers. However, it can be witnessed that the current PE program does not meet the expectations of students with 285 people accounting for more than half of the students (51.8%) said that the program did not meet the requirements. There are 367 people accounting for 66.7% who do not participate in extracurricular activities. The main reason is that there is no appropriate content for sports activities, accounting for 69.2%.

In which 100% of the students participating in extracurricular activities want to have the content of the appropriate training program, facilities, and guaranteed training instructors.

Thus, we figure out that the cause of the students' physical strength is not from the facilities, the teachers, or the students' consciousness, but mainly from the time the main program is too small, and there is no appropriate extracurricular content.

CONCLUSION

The physical strength of students at the University of Danang has not met the standards of physical strength standards of the Ministry of Education and Training prescribed for both men and women. The physical qualities have not been comprehensively developed, the weakest is endurance.

The main reason affecting the fitness of students is the limitation of time in the mainstream curriculum and the content of extracurricular physical training and sports activities.

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Research Article

Evaluating the efficiency of the strength improving exercise system for Danang University's male students

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ABSTRACT

Based on the conventional scientific research methods, we have selected 51 exercises belonging to four groups of physical strength and exercises to improve cardiovascular endurance. After 2 experimental semesters, 15 weeks of each semester, equivalent to 45 training sessions, the physical strength of the experimental group is much higher than the control group, meeting the fitness standards set by the Ministry of Education and Training in all tests. That has proven that the exercises, which we have selected, have the effect of improving the physical strength for male students of Danang University

Keywords: Danang University, Exercises, Male students, Physical strength improving

INTRODUCTION

Improving the physical strength of students to meet the requirements of comprehensive development is the educational goal of our Party and Government to train young generations, improve their physical and personality, enhance their working efficiency, and increase the lifespan. Through assessing the situation for many years, the physical strength of male students of Danang University has not met the standards of the Ministry of Education and Training, mainly due to the content of the curriculum has not met the requirements. In the face of this situation, we conducted an application study of an exercise system to improve the physical strength of male students of Danang University.

RESEARCH METHODOLOGY

During the research process, we have used those following methods: Methods of analyzing and synthesizing documents, pedagogical observation method, method of interviewing seminars, and pedagogical testing methods using 4/6 tests are specified in Decision No. 53/2008/QD-BGDDT of the Ministry of Education and Training; medical examination method and pedagogical experiment method were conducted in the form of parallel comparisons on two groups of students, the experimental group of 50 people and the control group of 31 people. The experimental group applied the physical improving exercises that we developed at extracurricular hours. The control group had the same extracurricular time as the experimental group but used other different exercises and statistical mathematical methods.

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RESEARCH RESULTS

Identify the Fundamentals and Principles for Choosing a Physical Strength System for Male Students of Danang University

Facility selection exercises

- Based on the psychophysiological characteristics of students aged 18–19 years
- Based on the physical condition of male students
- Based on the current physical education program
- Based on extracurricular learning needs
- Based on facilities and teachers which can meet teaching missions.

Principles of selecting exercises

- Exercises must develop comprehensively physical strength for male students
- Must be feasible on the subject and the training conditions, which are the male freshmen of Danang University

- Ensuring content, form, and amount of movement, which are suitable for the characteristics of the object
- Exercises must be diverse and creating excitement for practicing
- Exercises must approach the trend of modern physical strength training.

Based on the above principles, through reference materials, pedagogical observations, and survey interviews to 25 experts, we have selected 20 strength exercises; five exercises to develop strength quickly; five exercises to develop endurance; six exercises to develop flexible capacity; six exercises to develop cardiovascular endurance; and nine exercises to develop coordination capacity, stability, and balance, 51 exercises at total.

Strength exercise

Abdominal crunch: Plank, reverse crunch, crunch, flat bench lying leg raise, alternate heel touchers, lunge and squat exercise, lunge, walking lunge, side lunge, bodyweight squat, freehand jump squat, and wall squat.

Pushup: Push up, incline to push up, and push-ups with feet elevated

Plyometric exercise: Tuck jump, long jump, bench sprint, and mountain climbers.

Speed exercise

Twenty-meter run, 30 m run, 50 m run, and 70 m run and sprints.

Endurance exercise

Eight hundred meters run, 1500 m run, 400 m interval run, and 600 m interval run, 15 min, strength depending run for 15 min.

Flexibility and stretching exercise

Front leg raises, kneeling hip flexor, scissor kick, ankle on the knee, superman, and shoulder circles.

Cardio exercise

Lateral speed step, burgee, butt kicks, high knee jog, punch, and vertical mountain climber.

Coordination capacity, stability, and balance developing exercises

Three cone shuttle drill, agility T, 5–10–5 Pro agility drill, arrowhead agility drill, and compass drill.

Stability and balance exercise: Single-leg deadlift, single-leg jump squat, lunge to front kick, and speed skaters.

Experimental Plan Construction

Before constructing the experimental process, we drafted the questionnaire and asked to answer it in the negative format (yes or no). The results of the interview suggested problems related to the experimental process designs, which specifically are as follows:

- The experimental program should be arranged in extracurricular hours: The reason is to not affect the main curriculum
- Should practice 3 sessions per week to develop physical strength and be rational for the study schedule and extra-curricular of male freshmen
- The length of a training session is about 60–90 min, which is suitable for the amount of time for university students to deploy the selected exercises
- Prioritize the development of poor physical strength qualities
- In a training session should only focus on 1–2 qualities.

In addition, through the reference of professional materials, we place reliance on some of the following principles to build the process:

- Use the selected exercise system
- The selection exercises must be gradually improved from easy to difficult, from simple to complex
- The training method is based on the principles of physical education method to develop specific physical strength qualities
- Because these are physical strength exercises, not just teaching new techniques, so it is possible to repeat the exercises to develop physical strength.

Based on those given fundamentals, the project has built an experimental process in the two semesters of the 2018–2019 school years during extracurricular training. Each session lasts 15 weeks, 3 sessions per week, equivalent to 45 practice sessions per term.

During exercises, based on modern training methods, in which the high-intensity interval training method is used to train strength and cardiovascular endurance. Other qualities such as strength, endurance, and dexterity follow common physical education principles and methods such as rigorous training, game, and competition method, using verbal and visual means combined with principles such as positive self-discipline, visualization, appropriateness and specialization, systematic, and ascending requirements.

For the experiment to be conducted smoothly, both experimental and control groups have lecturers monitoring the level of attendance and the awareness of learning attitudes both during and after school hours. The physical training hours are conducted by lecturers of the School's Department of Education and Training during the project.

Experimental Results

After 1 year of the experiment, we conducted tests and compared the physical strength of both experimental and control groups. The following results are as follows:

Table 1: Comparison of physical strength of experimental and control groups after two semesters of experiment

Evaluating test	Criteria		Control group (*n*=31)		Experimental group (*n*=50)		Comparison	
	Good	Reached	*X*±δ	Evaluation	*X*±δ	Evaluation	*t*	*P*
Standing long jump (cm)	>225	≥207	208.2±20.1	Reached	249.2±22.3	Good	3.42	<0.01
30 m run (s)	<4.70	≤5.70	5.7±0.44	Reached	5.6±0.43	Reached	2.06	<0.05
Shuttle run 4×10 m (s)	<11.75	≤12.40	12.61±1.33	Unreached	11.64±1.24	Good	2.96	<0.01
5 min run (s)	>1060	≥950	903.5±106.7	Unreached	1032.8±80.6	Reached	3.27	<0.01
HW			15.6±1.5	Bad	9.7±1.8	Medium	3.66	<0.01

Table 2: Comparison of the physical growth rate of the experimental and control groups after two experimental semesters

Evaluating test	Control group (*n*=31)					Experimental group (*n*=50)				
	TTN	STN1	STN2	W1	W2	TTN	STN1	STN2	W1	W2
Standing long jump(cm)	198.7 20.7	204.5 17.2	208.2 20.1	2.9	4.7	202.8 8.3	218.8 15.33	249.2 22.3	8.9	20.5
30 m run(s)	6.62 0.88	6.23 0.56	5.7 0.44	6.1	14.9	6.87 1.33	6.21 1.33	5.6 0.43	10.1	20.4
Shuttle run 4 x 10m (s)	13.49 0.67	13.01 1.27	12.61 1.33	3.6	6.7	13.54 0.57	12.54 1.57	11.64 1.24	7.7	15.1
5 min run (S)	840.7 152.5	868.3 96.7	903.5 106.7	3.2	7.2	858.2 140.6	929 110.6	1032.8 80.6	7.9	18.5
HW	18.3 1.7	16.4 1.5	15.6 1.5	11.0	15.9	17.8 1.8	13.8 1.8	9.7 1.8	25.3	58.9

TTN: Before the experiment, STN1: After one semester of experiment, STN2: After 2 semesters of experiment, W1: Growth rate of achievement after one semester, W2: Growth rate after two semesters (compared to before the experiment)

Table 3: Comparison of physical strength evaluation results of two experimental groups and compared after two experimental semesters

Evaluating test	Control group (*n*=31)						Experimental group (*n*=50)					
	T	%	Đ	%	KĐ	%	T	%	Đ	%	KĐ	%
Standing long jump (cm)	3	9.7	10	32	18	58	19	38	27	54	4	8
Five minute run (S)	2	6.5	14	45	15	48	18	36	29	58	3	6
Shuttle run 4×10 m (s)	2	6.5	17	55	12	39	19	38	27	54	4	8
Five minute run (s)	1	3.2	11	35	19	61	17	34	28	56	5	10

The comparative results show that the average value of the test, the experimental group is much better than the control group in all four tests with very high statistical reliability at $P < 0.05 – P < 0.01$. The average value of the cardiac function of the experimental group responded at a medium level, while the control group was still poor, the difference reached the confidence level at $P < 0.01$, indicating that the experimental group had cardiac adaptation more than the control group. When comparing the average value with physical strength standards, after 1 year of study, the control group had two achieved indicators, two unachieved indicators, equivalent to the statistics in previous years, while two targets of the experimental group were achieved, two targets were better than the control group. From the above studies, we have confirmed that the exercises put into use have brought into play the efficiency in improving the physical strength for male students of Danang University. In addition to comparing the physical strength of those two groups, we also analyze the physical strength growth rate of the two groups. The following results are as follows:

The comparative results can see the remarkable growth rate of the experimental group compared to the control group after both semesters. The fastest growth rate of the experimental group is a cardiac function, followed by the test to assess strength and strength, endurance, and dexterity. In contrast, the control group of strength, dexterity, and endurance all grew but slowly.

The analysis results show that in the experimental group, the percentage of students with very good physical strength level

ranges from 34% to 38%, the reached level is also very high at about 54%–58%, only a few remain, around 6%–10%, is unreached. The experimental results of the experimental group were better than the control group and the performance level of the exercises that we compiled and have improved the physical strength, which meet the standards of fitness for students more than the usual exercises.

CONCLUSION

1. Based on the physical strength condition and guarantee conditions, through regular scientific research methods, we have selected the exercise system with 51 exercises put into practice at extracurricular time in two semesters. Each session lasts 15 weeks, 3 sessions per week corresponding to 45 practice sessions per term
2. Based on theoretical, practical principles, and traditional training methods combined with modern, we have implemented practical experiments in two semesters. Consequently, after the experimental period, the physical strength of the experimental group was much higher than that of the control group in all four tests with high statistical reliability at $P < 0.05 - P < 0.01$, proving the exercises, we selected, have helped to improve the physical strength for male students at the University of Danang.

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Research Article

Recovery characteristics of cardiovascular, biochemical, and hematological functions of the high-level shooting athletes in full capacity exercising

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ABSTRACT

Using routine scientific research methods, three evaluation indicators of cardiovascular function recovery ability and three evaluation indicators of biochemistry and hematology function recovery ability of the high-level shooting athletes in full capacity exercising have been selected. On that basis, medical examination methods and hematological and biochemical testing methods are used to evaluate the recovery process of cardiovascular function, hematology and biochemistry of the research subjects in full capacity exercising at times: Before exercising, after starting, while exercising (evaluate 10 s after completing exercising), and 10 min after exercising.

INTRODUCTION

Cardiovascular and biochemical hematological indicators are indicators that are sensitive to the amount of exercising in sports practice and sports competitions. Today, with modern equipment system applied in sports, it has allowed us to determine the exact exercising level and recovery ability of athletes after physical activities as well as training and teaching efficiency. This is also an important basis for training athletes.

At present, scientists in the world have identified the pattern of recovery after physical activity, fatigue characteristics after exercising in different capacity areas, the time needed to end the recovery of different biochemical processes during the resting period after exercising, as well as means and recovery methods for athletes after training and competition. However, in Vietnam, this work has not paid attention to and researched by any author.

With the existing modern equipment system, we conduct the research: Characteristics of cardiovascular, biochemical, and hematological recovery functions of high-level shooting athletes in full capacity exercising.

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RESEARCH METHODOLOGY

The research process uses methods:

- Methods of analyzing and synthesizing documents
- Interview method
- Medical examination method
- Test method (biochemistry and hematology)
- Methods of statistical mathematics.

RESEARCH RESULT

1. Select indicators to assess the recovery ability of cardiovascular, biochemical, and hematological functions for high-level shooting athletes in full capacity exercising.

Using methods of analyzing and synthesizing documents, interviewing method, three indicators were selected to assess the recovery ability of cardiovascular function of high-level shooting athletes in full capacity exercising includes: Heart frequency (times/min), maximum blood pressure (mmHg), and minimum blood pressure (mmHg); at the same time, three indicators were selected to assess the recovery ability of biochemical and hematologic function of high-level shooting athletes in full capacity exercising including: Urea (mg/dl), glucose (mmol/l), and blood lactate (mmol/l).

The research was conducted on 14-level one shooting athletes and grandmasters. Including 10 male athletes aged 17–29 and four female athletes aged 14–16.

The exercise selected to represent full capacity exercising: Running 100 m (s).

We conducted collecting data to assess the characteristics of cardiovascular, biochemical, and hematological recovery functions of high-level shooting athletes in full capacity exercising at different times: Before exercising (before athletes start training activities); after starting (immediately after the athlete completes the general and professional warm-ups for full capacity exercises); while exercising (10 s after athletes complete full capacity exercising) and minutes after exercising (10 min after the completion of full capacity exercising).

Data to assess cardiovascular function were taken by directly checking pulse and blood pressure measurement with Omron mechanical meter.

Data to assess biochemical and hematological function were taken using Cobas 6000 automatic biochemical machine, AU 2700 machine made in Japan.

2. Recovery ability of cardiovascular function of high-level shooting athletes in full capacity exercising.

Characteristics of Indicators Reflecting Cardiovascular Function of High-level Shooting Athletes before Exercising in Full Capacity Area

The cardiovascular indicators while resting as well as moving always attract the special attention of coaches and scientists because of their information and sensitivity to the amount of exercising. Through cardiovascular indicators, professionals can assess the impact of the amount of exercise, the body's ability to adapt to the amount of exercise, the level of recovery, and especially to assess the long-term change reflects the degree of adaptation and effectiveness of the training process. Particularly, rest cardiovascular indicators reflect the long-term changes of cardiovascular system that occurs during the training and competition of athletes.

The characteristics of the indicators reflecting cardiovascular function of high-level shooting athletes before exercising are presented in Table 1.

Table 1 shows that before exercising, the characteristics of cardiovascular indicators of high-level shooting athletes are within the normal biological limit of Vietnamese people of the same age and gender, but the results reached a good threshold. This shows that the cardiovascular indicators' characteristics in athletes of sport research subjects are good, allowing to increase the amount of exercise in the training process.

Table 1: Characteristics of cardiovascular indicators of high-level shooting athletes before exercising

No.	Norms	Male (aged 17–19) (*n*=10)		Female (aged 14–16) (*n*=04)	
		$\bar{x}$	σ	$\bar{x}$	σ
1	Heart frequency (times/min)	71.54	6.87	75.27	7.02
2	Maximum blood pressure (mmHg)	119.7	6.43	111.3	6.37
3	Minimum blood pressure (mmHg)	68.17	4.43	64.62	5.78

Characteristics of Indicators Reflecting Cardiovascular Function of High-level Shooting Athletes after Starting in Full Capacity Exercising Area

As is known, cardiovascular indicators are particularly sensitive to the amount of exercising. After starting in full capacity exercising area, when the athletes have participated in the general and professional warm-ups, the cardiovascular indicators of athletes have changed significantly. The results are presented in detail in Table 2.

Table 2 shows that after starting, cardiovascular indicators of athletes have significant changed. Specifically, the heart frequency of athletes increased very strongly. This is a transformation that increases blood circulation, prepares for exercising. Maximum blood pressure increases in parallel with the increase in heart frequency; minimum blood pressure is unchanged or slightly reduced.

In conclusion, after starting, cardiovascular indicators of high-level shooting athletes changed quite well, allowing to raise the amount of exercise during the training process.

Characteristics of Indicators Reflecting Cardiovascular Function of High-level Shooting Athletes While Exercising in Full Capacity Area

Characteristics of cardiovascular function of high-level sports athletes while exercising in full capacity area are presented in detail in Table 3.

Table 3 shows that while exercising in full capacity area, the cardiovascular indicators of athletes had significant changes compared to the time before conducting the test (after starting). Specifically, heart frequency increased by about 50%, maximum blood pressure slightly increased, and minimal blood pressure remained unchanged or decreased slightly. This is perfectly consistent with the exercising performance characteristics in full capacity area, because while exercising, the indicators of cardiovascular function almost do not increase and increase after stopping. The increase reached the highest value at 1–1.5 min after stopping.

At 10 s after completing the exercise, the indicators are still in a rising time.

Characteristics of Indicators Reflecting Cardiovascular Function of High-level Shooting Athletes 10 min after Exercising in Full Capacity Area

Tests were conducted to check the cardiovascular function of high-level sports athletes 10 min after exercising in full capacity area, while compare the results obtained with the examination of cardiovascular function characteristics of the athlete before starting the test. Results are presented in Table 4.

Table 4 shows that 10 min after completing exercising activities in full capacity area, the cardiovascular function characteristics of the athletes have recovered beyond the time after starting and have gone back to indicators at normal conditions (before exercising). This can be explained that exercising in full capacity area takes place in a short period of time, circulation parameters are not able to increase during the exercising process but only really increase after stopping, at the same time, the parameters also decrease to normal status after 5–7 min. Therefore, 10 min after exercising, the cardiovascular indicators returned to normal levels.

Table 2: Characteristics of cardiovascular indicators of high-level shooting athletes after starting in full capacity exercising area

No.	Norms	Male (aged 17–19) (*n*=10)		Female (aged 14–16) (*n*=04)	
		$\bar{x}$	σ	$\bar{x}$	σ
1	Heart frequency (times/min)	103.29	7.62	102.11	8.26
2	Maximum blood pressure (mmHg)	129.35	6.57	127.27	7.05
3	Minimum blood pressure (mmHg)	67.17	4.45	64.52	5.71

RECOVERY CHARACTERISTICS OF BIOCHEMICAL AND HEMATOLOGICAL FUNCTION OF HIGH-LEVEL SHOOTING ATHLETES IN FULL CAPACITY EXERCISING

Characteristics of Indicators Reflecting the Biochemical and Hematological Function of High-level Shooting Athletes before Exercising in Full Capacity Area

Biochemical and hematological indicators are considered the most important indicators, highly sensitive to the amount of exercise and reflect objectively and reliably the biological adaptive capacity of the body with the amount of exercise as well as the body's recovery ability after exercise. However, practicality and ability to universalize are not high due to the limitation of biological knowledge as well as the cost of high research activities, so it is often considered as in-depth studies and only applied to high-level athletes.

Within the scope of the study, the topic analyzed three specific criteria selected. Specific results of hematological and biochemical indices of high-level shooting athletes before exercising in full capacity area are shown in Table 5.

Table 5 shows that in the pre-exercise period, the characteristics of hematological and biochemical indicators of high-level shooting athletes are within the normal biological limit and reach the optimal threshold. However, it should be noted that this is the observe norms in athletes, so it is not fully consistent with the biological norm in normal people. Specifically, blood lactate index (mmol/l) according to biological constant, in static ranged from 0.8 to 1.5, while in athletes is considered fully recovered with blood lactate (mmol/l) <3.0. This is explained

Table 3: Characteristics of cardiovascular function of high-level shooting athletes while exercising in full capacity area

No.	Norms	Male (aged 17–19) (*n*=10)			Female (aged 14–16) (*n*=4)		
		$\bar{x}$	σ	% change	$\bar{x}$	σ	% change
1	Heart frequency (times/min)	153.5	15.23	48.56	152.3	15.27	49.13
2	Maximum blood pressure (mmHg)	136.3	13.53	5.37	136.1	13.58	6.94
3	Minimum blood pressure (mmHg)	67.03	6.55	−0.21	64.41	5.34	−0.17

Table 4: Characteristics of cardiovascular function of high-level shooting athletes 10 min after exercising in full capacity area

No.	Norms	Male (aged 17–19) (*n*=10)			Female aged 14–16) (*n*=04)		
		$\bar{x}$	σ	% recover	$\bar{x}$	σ	% recover
1	Heart frequency (times/min)	75.78	7.32	154.79	77.49	7.43	149.05
2	Maximum blood pressure (mmHg)	118.43	6.76	257.12	116.35	6.67	223.67
3	Minimum blood pressure (mmHg)	67.12	6.08	64.29	64.49	6.12	72.73

by the state of psychological stress and should be paid attention to when evaluating, especially in the pre-competition stage.

Characteristics of Indicators Reflecting the Biochemical and Hematological Function of High-level Shooting Athletes after Starting in Full Capacity Area

At the time after completing the general and professional warm-ups for exercising in full capacity area, at the same time checking cardiovascular indicators of athletes, the research collected blood samples to check biochemical indicators selected. The results are presented in Table 6.

Table 5: Characteristics of biochemical and hematological indicators of high-level shooting athletes before exercising

No.	Norms	Male (aged 17–19) (*n*=10)		Female (aged 14–16) (*n*=04)	
		$\bar{x}$	σ	$\bar{x}$	σ
1	Urea (mg/dl)	4.21	0.21	4.69	0.29
2	Glucose (mmol/l)	4.54	0.24	4.51	0.25
3	Blood lactate (mmol/l)	2.23	0.20	2.15	0.19

Table 6: Characteristics of biochemical and hematological indicators of high-level shooting athletes after starting in full capacity area

No.	Norms	Male (aged 17–19) (*n*=10)		Female (aged 14–16) (*n*=04)	
		$\bar{x}$	σ	$\bar{x}$	σ
1	Urea (mg/dl)	4.31	0.22	4.62	0.27
2	Glucose (mmol/l)	4.76	0.37	4.69	0.36
3	Blood lactate (mmol/l)	2.25	0.22	2.18	0.20

Table 6 shows that after starting in full capacity area, the biochemical and hematological indicators of high-level shooting athletes tend to increase slightly compared to the time before the exercise. However, these indicators still fall under the optimal threshold according to the normal biological limits of Vietnamese people.

Characteristics of Indicators Reflecting the Biochemical and Hematologic Function of High-level Shooting While Exercising in Full Capacity Area

Immediately after completing the exercise (within 10 s after completing the test), the research conducted blood tests to assess the characteristics of biochemical and hematological indicators of chosen sports athletes exercising in full capacity area. The results are presented in Table 7.

Table 7 shows that while exercising in full capacity area, the biochemical and hematological indicators of sports athletes vary in a slight increase in most indicators; however, the increase is 10% lower than the time after the warm-up.

Characteristics of Indicators Reflecting the Hematological Function of High-level Shooting Athletes 10 min after Exercising in Full Capacity Area

Blood tests of high-level sports athletes were taken 10 min after exercising in full capacity area, at the same time compared the results obtained with the test results of biochemical and hematological of athletes before making the test. Results are presented in Table 8.

Table 7: Characteristics of biochemical and hematological indicators of high-level shooting athletes while exercising in full capacity area

No.	Norms	Male (aged 17–19) (*n*=10)			Female (aged 14–16) (*n*=04)		
		$\bar{x}$	σ	% change	$\bar{x}$	σ	% change
1	Urea (mg/dl)	4.48	0.37	3.94	4.79	0.29	3.68
2	Glucose (mmol/l)	5.21	0.41	9.45	5.16	0.38	10.02
3	Blood lactate (mmol/l)	2.37	0.25	5.33	2.23	0.21	2.29

Table 8: Characteristics of hematological and biochemical indicators of high-level shooting athletes in full capacity area at 10 min after exercising

No.	Norms	Male (aged 17–19) (*n*=10)			Female (aged 14–16) (*n*=04)		
		$\bar{x}$	σ	% recover	$\bar{x}$	σ	% recover
1	Urea (mg/dl)	4.19	0.28	170.59	4.59	0.30	117.65
2	Glucose (mmol/l)	5.29	0.33	−17.78	5.25	0.37	−19.15
3	Blood lactate (mmol/l)	2.72	0.11	−291.67	2.39	0.09	−320.00

Table 8 shows that 10 min after the completion of exercising in full capacity area, the test characteristics of biochemical and hematological indicators of athletes have significant changes. Specifically, blood urea indicator changed to the level of after starting; glucose indicator increased compared to the time after the warm-up in all athletes of all sports; this is consistent with the exercising pattern. Blood lactate indicator (mmol/l) increased slightly in sports.

CONCLUSION

- Before exercising, cardiovascular function characteristics and biochemical hematological indicators of high-level shooting athletes are at the optimal level of normal people of the same age and gender. However, it should be noted that this is the observed standard in athletes, so it is not fully consistent with the standard of biological constant in normal people.
- After starting the preparation for the full capacity exercise, all evaluation indicators of cardiovascular, biochemical, and hematological functions of athletes have significant changed in the direction of increasing, expressing the adaptation with exercising.
- While exercising, the indicators of cardiovascular, biochemical, and hematological functions evaluation of athletes increased. The highest increase was achieved in the vascular frequency, then the maximum blood pressure, the increase was lower in the biochemical and hematological indicator, particularly the minimum blood pressure indicator was unchanged or decreased slightly. This is entirely consistent with the exercising pattern in full capacity area.
- A 10 min after exercising, the characteristics of cardiovascular, biochemical, and hematological functions of the athletes recovered to the level before exercising, there were some indicators that recovered to better levels after starting.

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Research Article

The overweight reality of 9-year-old students at the primary school – Lien Chieu district – Danang city

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ABSTRACT

Based on the assessment of overweight reality of 207 students aged 9 (119 male and 88 female students) in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City, we have some following aspects as current health, periodic health checkup, daily diet, water intake/day, exercise regime and time, body mass index, and other causes of overweight to do a basis for choosing a weight loss adjustment method for 9-year-old students at Ngo Si Lien Primary School – Lien Chieu District – Da Nang City.

Keywords: 9 Years old, Danang city, Lien Chieu district, Ngo Si Lien Primary School, Overweight, Students, Weight loss

INTRODUCTION

In Vietnam, some epidemiological surveys before 1995 showed that the rate of overweight is negligible and is almost no obesity. However, the general nutrition survey of the whole country in 2000 showed that the rate of women overweight from 15 to 49 years old was 4.6%; there were 3 times in city (9.2%) higher than in rural areas (3.0%). According to the overweight and obesity investigation, it showed that 16.3% of Vietnamese adults in 2005 were being overweight and obese, and the rate of the urban areas was 32.5% and it was higher compared with the rate of rural areas as 13.8%.

The increasing overweight rate of the students at the primary school is one of the most concerns in the developed and developing countries not only due to the diet without balance (imbalance with body need) but also due to related factors (exercises activities reduction, stress, environmental pollution, and social issues). People are concerned about being overweight because it is a long-term threat to health and longevity, and it prolonged obesity to adulthood, which will increase the risk for chronic sicknesses such as hypertension, coronary artery disease, diabetes, osteoarthritis, gallstones, fatty liver, and some cancers. The overweight of primary school students also stops early growth, which can lead to severe psychological effects such as low self-esteem, shyness, poor sociability, and poor academic performance. The overweight of primary school students can be a source of a health disaster in future. The assessment of the overweight reality of students aged 9 in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City as a basis for selecting weight loss adjustment measures for 9-year-old students at Ngo Si Lien Primary School – Lien Chieu District – Da Nang City is a necessary thing.

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METHODS

During our research process, we used the following methods, such as analyzing and synthesizing documents methods, interviewing method, and math statistic method to assess the overweight reality of students aged 9 in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City.

RESULTS

The Characteristics of the Research Subjects

To find out the characteristics of the study subjects, we conducted the interview to 207 pupils of age 9 (119 male and 88 female students) in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City. The number of votes is issued

as 207, the number of votes is collected as 207. The results are presented in Table 1.

Table 1: The characteristics of the research subjects (age of 9, *n*=207)

No.	The characteristics of subjects	*n*	%
1	Gender		
1.1	Male	119	57.49
1.2	Female	88	42.51
2	Current health status		
2.1	Very well	17	8.21
2.2	Well	185	89.37
2.3	Average	5	2.42
2.4	Weak	0	0.00
3	Periodic health checks up		
3.1	Usually	196	94.69
3.2	Unusual	11	5.31
4	Adding more milk in the daily diet		
4.1	Usually	371	84.90
4.2	Unusual	61	13.96
4.3	No use	5	1.14
5	Adding more fruits and vegetables		
5.1	Usually	83	18.99
5.2	Unusual	347	79.81
5.3	No use	7	1.60
6	Total amount of drinking water/day		
6.1	No drink	0	0
6.2	≤0.5 L	43	9.84
6.3	1 L–2 L	375	85.81
6.4	> 2 L	19	4.35
7	Doing exercises		
7.1	Usually	53	12.13
7.2	Unusual	361	82.61
7.3	No practice	23	5.26
8	Time of doing exercises		
8.1	<30 min	372	85.13
8.2	30 min–60 min	56	12.81
8.3	60 min–120 min	9	2.06
8.4	>120 min	0	0
9	Sports subject		
9.1	Football	117	26.77
9.2	Basketball	19	4.35
9.3	Badminton	91	20.82
9.4	Chess	78	17.85
9.5	Martial arts	43	9.84
9.6	Aerobic	89	20.37
9.7	Others	0	0

The results in Table 1 show that the cause of directly affects to the overweight situation of 9-year-old students in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City is that they are in good health and have regular checkups. In addition, they are not often supplemented with milk, the amount of fruit and vegetables in the diet, the amount of water they daily drink with a range of 0.5 L–1 L, they are unusual to do exercises, their subject sport is selected to practice so little, and their daily doing exercise time is <30 min.

The Overweight Reality of 9-Year-old Students in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City

To assess the overweight reality of 9-year-old students, we check their height and weight and then classify the study subjects through the test method to determine the biological relationship between environmental factors (weight) and genetic factors (height) by body mass index. The results are presented in Tables 2 and 3.

The results in Tables 2 and 3 show that the rate of overweight 9-year-old students includes 23/119 accounted for 19.33% in male students and 15/88 accounted for 17.05% in female students.

If we compared this rate with the rate in 2003, the rate of overweight children aged 7–12 in the Ha Noi city would be 7.9% (male: 8.5% and female: 7.2%), and there was a disorder of lipid in children's blood with overweight and obese: 66.7% increased in triglycerides blood, 10.5% increased in total cholesterol, and 5.7% increased in LDL-C.[4] The research of Tran Phuc Nguyet in the Ha Noi conducted that the rate of overweight and obese children aged 4–6 was 4.9%, boys are 6.1%, and girls are 3.8%.[6]

The Overweight Cause of 9-Year-old Students in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City

Through various documents of the authors, we have identified the causes of overweight or weight loss including nutrition, exercise regime, and daily routine.

We conducted to interview 24 experts, managers, and teachers, their response was assessed at three levels: Very

Table 2: BMI index of 9-year-old students in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City (*n*=207)

Gender	BMI		
	$\bar{x}$	±δ	Cv
Male (*n*=119)	16.34	0.17	1.03
Female (*n*=88)	15.41	0.13	0.82

BMI: Body mass index

Table 3: The overweight reality of 9-year-old students in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City

No.	BMI index		*n*	%
1	Students with serious malnutrition and stunt	<15.84	3	2.52
2	Students with moderate malnutrition and stunt	<16.00	8	6.72
3	Normal students	16.01–16.51	81	68.07
4	Overweight students	>16.52	23	19.33
5	Obese students	>16.84	4	3.36
Female students (*n* = 88)				
1	Students with serious malnutrition and stunt	<15.03	2	2.27
2	Students with moderate malnutrition and stunt	<15.16	8	9.09
3	Normal students	15.17–15.54	58	65.91
4	Overweight students	>15.55	15	17.05
5	Obese students	>15.79	5	5.68

BMI: Body mass index

Table 4: The overweight cause of 9-year-old students in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City

No.	Cause	Cause					
		Very effective		Effective		Ineffective	
		n	%	*n*	%	*n*	%
1	Nutrition	21	87.50	3	12.50	0	0
2	Exercise regime	18	75.00	6	25.00	0	0
3	Daily routine	19	79.17	5	20.83	0	0

effective, effective, and ineffective. The results are presented in Table 4.

The results in Table 4 show that all three above causes (nutrition, exercise regime, and daily routine) influencing the overweight reality of 9-year-old students in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City were consensually assessed by the manager, expert, and teacher consensus with the very effective level and oscillated from 75% to 87.50%.

CONCLUSION

- The cause of directly affects to the overweight reality of 9-year-old students in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City is that they are in good health and have regular checkups. In addition, they are not often supplemented with milk, the amount of fruit and vegetables in the diet, the amount of water they daily drink with a range of 0.5 L–1 L, they are unusual to do exercises, their subject sport is selected to practice so little, and their daily doing exercise time is <30 min.
- The overweight reality of 9-year-old students in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City has increased by 10.83% for males and 9.85% for females.
- Through this research, it shows that there are 38 overweight students, including 23 male and 15 female students.
- We have identified three main causes that directly affect the overweight reality of 9-year-old students in Ngo Si Lien Primary School – Lien Chieu District – Da Nang City, including nutrition, exercise regime, and daily routine.

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Research Article

Reality of speed training with front kick for male athletes learning traditional martial art aged 14–15 in Hanoi city

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ABSTRACT

Using conventional scientific research methods to conduct the training of speed-strength training of front kicking for male athletes aged 14–15 of Hanoi traditional martial arts team to select exercises of speed on front kicking techniques for male athletes aged 14–15 for the study subjects.

Keywords: Ages 14–15, Athletes, Hanoi city, Reality, Speed strength, Traditional martial arts, Training

INTRODUCTION

Traditional martial art is a martial art of the nation, but along with the ethnicity and attractiveness in the simple, effective, and esthetic technical system, especially in the rich arm and leg group. Traditional martial arts have become a strongly developed martial art in our country with a large number of students participating in practice.

The training of traditional martial arts, characterized by a direct and strong fighting sport, should be used to gain high achievements, in addition to good preparation in tactics, physical, psychological, and willpower… The athlete must maximize the power of speed in attack techniques, especially front kick for male athletes of traditional martial arts aged 14–15 teams of Hanoi martial arts team. Therefore, the practice requires research and assessment of the current situation of speed developing exercises for this subject.

Originating from the above issues, to contribute to improving the quality of teaching traditional martial arts for the athletes of the Hanoi traditional martial arts team, we proceed: The reality of speed training of front kick for male traditional martial arts athletes aged 14–15 of Hanoi traditional martial arts team.

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RESEARCH METHODOLOGY

During the research, we use the following research methods: Methods of analysis and synthesis of references, pedagogical observation method, interview method, pedagogical test method, and statistical math method.

RESULTS AND DISCUSSION

Situation of Training Program for Male Traditional Martial Arts Athletes Aged 14–15 of Hanoi Traditional Martial Arts Team

To evaluate the status of the training program for male martial arts athletes aged 14–15 over a year of practice. The results are presented in Table 1.

Table 1 shows that the number of training sessions for physical training is still small compared to the number of training sessions for technical and tactical training (the number of physical training sessions only accounts for 21.53%). But that's the number of training sessions for general physical exercise. How much time you spend and what physical training you train will depend on the specific coach.

Current Situation of the Distribution of Speed Strength Training Time for Male Traditional Martial Arts Athletes Aged 14–15

Analyzing the training program and interviewing directly the coaches doing traditional martial arts training in Hanoi, the thesis summarizes the results in Table 2.

Table 2 shows that the rate of training sessions of fast strength and speed-strength is 45.16%, equivalent to 14 sessions of strength training, and speed training. Strength and speed are very important in a traditional martial art; according to experts, it is necessary to practice the power of strength and speed in all exercise sessions for the target subjects.

Effective Attacks in Traditional Martial Arts Competition in Hanoi

Assessing the effectiveness of attacks in Hanoi's traditional martial arts competition in 2015, specific results are presented in Table 3.

Table 1: Distribution of training time by male traditional martial athletes aged 14–15 in 1 year

No.	Forms of training	Training plans	Total ratio (%)
1	Technique	43	29.86
2	Strategy	40	27.78
3	Physical	31	21.53
4	Competition	30	20.83
Total		144	100

Table 2: Current situation of speed training time for male traditional athletes aged 14–15

No.	Content	Teaching plans	Ratio %
1	Fast strength	6	19.35
2	Speed strength	8	25.81
3	Stamina	8	25.81
4	Movements coordinating ability	7	22.58
5	Flexibility	2	6.45
Total		31	100.00
Speed capacity			
Fast strength		25.81	25.81
Speed strength		9.68	9.68
Speed stamina		6.45	6.45
Total		13	41.94

Table 3 shows regarding the frequency of using front kicks during the competition: Through observation, it shows that male traditional athletes aged 14–15 years old teams in Hanoi's traditional martial arts used front kick in the competition are relatively much, but the effect is not high. Of the 110 front kicks, male traditional athletes aged 14–15 in Hanoi traditional martial arts team only succeeded 18 times (accounting for 16.40%). This success rate is low compared to the overall rate of teams observed.

Situation of Using Strength Training Exercises to Speed Up Front Kicks for Male Traditional Athletes Aged 14–15 of Hanoi Traditional Martial Arts Team

Assessing the status of exercises to develop the speed of front kick first for male traditional martial arts athletes aged 14–15 in Hanoi traditional martial art team through reference to related documents, observing the physical training for traditional martial arts athletes aged 14–15 in Hanoi traditional martial art team and some traditional martial arts training units in Hanoi and neighboring provinces. There is a thriving traditional martial movement. We have synthesized 41 exercises divided into groups: Group of exercises to develop general speed strength and Group of exercises for developing professional speed and Game and competition group:

Group exercises for developing general speed-strength (15 exercises):

1. Feet wearing 1 kg lead, Adam jumping
2. Leaping sideways kicking two legs two sides continuously
3. Leaping and high jumping continuously
4. 5 m running and jumping on both sides
5. 15 m running and jumping with two legs back and forth
6. Leaping and jumping drawing knees, running for 15 m
7. High rope jumping
8. Run in place with thigh-high
9. Pinch toes for 30 s
10. High podium step up and down
11. Weightlifting 20 kg, sit down and stand up
12. Weightlifting 20 kg jumping with legs changing
13. Jumping and jumping to draw knees on the sand
14. Pinch toes
15. Duck movements.

Table 3: Efficiency of front kick in traditional martial arts competition (n=15 matches)

No.	Unit	Number of time use	Effective		Ineffective	
			Amount	Ratio %	Amount	Ratio %
1	People's police	108	35	32.40	73	67.60
2	Army	102	32	31.40	70	68.60
3	Bac Ninh	111	28	25.30	83	74.70
4	Ninh Binh	98	31	31.70	67	68.30
5	Hanoi City team	110	18	16.40	92	93.60
6	Hai Phong	97	22	22.70	65	87.30

Professional speed developing exercises (23 exercises):

1. Front kick to goal continuously
2. Round kick to goal continuously
3. Round kick with two legs continuously into the goal
4. Axe kick repeatedly into the goal
5. Hook kick the opposite target two 3 m
6. Side kick from outside with a dominant foot
7. Combine front kick and round kick to the goal
8. Combine axe kick and horizontal kick to the goal
9. Foot wearing 1 kg lead front kick continuously
10. Foot wearing 1 kg lead back kick continuously
11. Foot wearing 1 kg lead axe kick continuously
12. The foot wearing 1 kg lead kicking across continuously
13. Foot wearing 1 kg lead kick from outside with a dominant foot
14. Legs with a rubber band, front kick to the target continuously for 20 s
15. Legs with a rubber band, round kick to goal continuously
16. Legs with a rubber band, axe kick to goal continuously
17. Legs with rubber band, kick across to the opposite target 2 m away
18. Legs with a rubber band, sidekick from outside with dominant leg
19. Combine two kicks to target continuously
20. Combine three kicks to target continuously.

Games and competition exercises (six exercises):

1. Crab kicks the ball
2. Duck kicks the ball
3. Jumping sheep
4. Relay hopping
5. Relay pinch toes
6. Relay duck movements.

Analyzing the status of using speed training exercises for front kick for male traditional athletes aged 14–15 in Hanoi traditional martial arts team.

The exercises used are few in number and types of exercises, resulting in no interest for athletes in the training process, and creating adaptations in the use of effective exercises. The result is not really high.

- Exercises are generally used for all athletes, regardless of age, gender, and level of exercise.
- The exercises are used according to the experience of teachers but have not been researched to determine the effectiveness of exercises on the target learner.
- The exercises used are not arranged in the specific program or process but are used according to the teacher's experience, so it is difficult to monitor the frequency of use and the effectiveness of the exercises used.

CONCLUSION

- The front kick is of high importance in traditional martial arts competition. In fact, the male martial artist at the age of 14–15 in Hanoi's traditional martial art team uses a lot of these kicks, but the effect is not really high.
- The reality of the exercises to develop the speed of front kick for male traditional martial arts athletes aged 14–15 of Hanoi traditional martial arts team does not have a unified system, there is little in number of exercises and types of exercises, regardless of age, gender, level of training, nor grouping exercises, exercises that have not been arranged in a specific program or process but used according to the teacher's experience, so it is difficult to monitor the frequency of use as well as the effectiveness of the exercises used.

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Research Article

The relationship between physical fitness and academic performance of rural and urban secondary school students in Ethiopia

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ABSTRACT

In the present study, an attempt has been made to compare physical fitness components, namely, cardiorespiratory fitness, agility, flexibility, power, speed, and muscular endurance between students belonging to rural and urban set-ups and its impact on academic performance. The study was carried out on 80 students, 40 rural and 40 urban of Amanuel versus Girakidamin secondary school in Machakil Woreda. The tests were 1.5 mill run test, Illinois agility run test, sit and reach test, shot put test, 50 m sprint run test, and 90° push-up test. To gather data about the student's academic performance, the researcher had taken examination/test results and teacher reported conduct grade which was recorded in 2018 academic year first semester from the registrar office. The researcher had taken the mean score of all subjects except PE, namely, Amharic, English, mathematics, physics, chemistry, biology, geography, history, ICT, and civics which registered first semester in 2010 E.C academic year. To examine the relationships in physical fitness level between the two groups and determine the relationship between physical fitness and academic performance, the data were analyzed and compared by Statistical Package for the Social Sciences (IBM SPSS version 23). When the researcher has seen the relationship of fitness variable with academic performance in Pearson's correlation, CRF, agility, speed, and strength endurance correlate to academic performance negatively but statistically insignificant. The rest power and flexibility correlate to academic performance positively but statistically insignificant.

Keywords: Academic performance, Physical fitness, Rural and Urban

INTRODUCTION

This topic states as comparative study between urban and rural secondary school student's physical fitness level and its impact on academic performance in Ethiopia. Physical fitness has been defined by different scholars in different literature. Baltimore *et al*.., 1995, defined physical fitness as, the ability of the body to perform moderate to vigorous levels of physical activity without undue fatigue and capability of maintaining such abilities throughout the life. American College of Sports Medicine has also defined physical fitness as a set of characteristics (i.e., the work capacity of heart and lungs, the strength and endurance of muscles, and the flexibility of joints) that relate to the ability to perform physical activities (Enter, 1997). Physical fitness is associated with a person's ability to work effectively, enjoy leisure time, be healthy, resist hypokinetic diseases or conditions, and meet emergency situation (Corbin *et al*., 2006). Every person has a different level of physical fitness which may change with time, place of work, and situation and there is also an interaction between the daily activities, and the fitness of an individual, the point if where to put the level of optimum fitness. Although physical fitness is influenced by genetics and environmental factors, physical exercise is one of the main determinants (Andersen, 2003). Uppal and Sareen (2000) conducted a study to find out the comparison on cardiovascular fitness between rural and urban students and revealed that students with rural background performed better than that of their counterparts in urban area. Charles (2006) conducted a study on the "Differences in health for rural and urban Canadians." His report shows that Canadians living in rural areas generally have higher mortality rates than those living in urban areas. Human body is a gift by nature. Life in the computer age is not less than the blessings of God. Scientific discoveries have changed the entire face of our planet. It has changed the entire face of our planet. It

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has changed the thorny life into the bed of roses. Good health provides sound and solid foundation on which fitness rests and at the same time, fitness provides one of the most important keys to health and living one's life to fullest. In villages which formed the first habitation of civilized man, rural sports grew out of sheer necessity. Joint defense against on sloughs of a common foe and dangerous animals must have given birth to sports such as wrestling, running, jumping, weight lifting, and such performing arts as measuring strength by holding wrists and twisting hands. Same is the case with games and sports in rural and urban settings. We notice that there is a lot of difference in the interest of children. Like we observe that in rural areas, children are indulging in minor, indigenous activities and field games such as football, hockey, wrestling, and athletics, whereas in urban, we find children playing basketball, play station, volleyball, football, table tennis, squash, watching film, etc. The main cause of difference is the availability of facilities and financial support of parents. The urban people with the growth of cities has come a great transformation in the living habits of society. The city is the hub of much social life, and it influences its standards. Intellectual growth and habits, moral codes and conditions, behavior patterns, and cultural conditions resolve around it. New communities, new group, new ethnic relations, and a multitude of classes make of the city an intricate and complex unit of modern society.

A number of studies stated that have found correlations between physical activity, physical fitness, and improved academic performance along with other cognitive performance measures. The following studies include longitudinal, cross sectional, and correlational. The California Department of Education (2002), as reported by Grissom (2005), confirmed a strong relationship between physical fitness and academic performance. Higher levels of physical fitness have been associated with higher academic achievement (California Department of Education, 2001). Similar research conducted in a school setting, observed a positive relationship between vigorous physical activity and higher academic achievement in the classroom, and based on grades (Coe, Pivarnik, Womack, Reeves, and Malina, 2006). Other researches have found a link between aerobic fitness to an increase in neuroelectric and behavioral performance in children (Hillman, Castelli, and Buck, 2005). These findings suggest that students who exhibit a greater amount of time being physically active have a greater allocation to their working memory. In addition, Sibley and Ethnier (2003) conducted a meta-analysis that confirmed a slight significant relationship exists between physical activity and cognitive performance in children. These findings confirm that physical activity may be beneficial to children's cognitive health and academic achievement. Several studies evaluated physical fitness profiles of people in different areas, and understanding the relationship between physical fitness and academic achievement has been a popular subject to research. However, relatively little information was available in Machakill Woreda about physical fitness level of rural and urban area secondary school students and its impact on academic performance. Because urban student believed that urban students have better physical fitness than rural. On the contrary, rural students believed that rural students more physically fit than urban. In addition to this, even though several studies confirm that physical activity and physical fitness correlate with academic performance positively, the number of student believed that physical activity and physical fitness are the factors that affect decline of academic performance. According to this reason, the researcher want to compare the rural and urban students and to find out which of these two groups' is more physically fit in response to tests administered and determined the impact of physical fitness on academic performance of the students.

PURPOSE OF THE STUDY

The success and competence of any physical fitness depend on the ability of the performer to effectively achieve the given task on time. The main benefit of any research is increase in knowledge, dig out problems, and find possible solutions, the study which carried out by one researcher may be further studied and would be studied by others. Many times this is the increase in knowledge on a specific issue. The main aim of this study was to compare physical fitness level of urban and rural secondary school students and its impact on academic performance in case of some selected secondary school in Ethiopia. In general, this study will have the following contributions:

The study was expects to contribute in the determination of student physical fitness level of urban and rural area secondary school students and its impact on academic performance. If the student who has better understanding of possible rural-urban differences in physical fitness and its impact on academic performance, profiles may fill the gap and find out possible solutions to develop their physical fitness level and academic performance. In short, this study needs to correlate the lifestyle difference on students' physical fitness variables and its impact on academic performance.

RESEARCH QUESTION

What are the relationship between physical fitness and academic performance of rural and urban secondary school students?

DESIGN OF THE STUDY

Correlational design study was used to address the current status of physical fitness level between urban and rural area secondary school students and correlation design study was

employed to address the relationship of physical fitness level with academic performance of urban and rural secondary school students.

POPULATION AND SAMPLE SIZE

The researcher was selected only two secondary public schools using purposive sampling technique because the researchers believed that the two schools had the information needed for research (Malhotra, 2010). Those two schools were Girakidamin secondary school and Amanuel General secondary school. The lifestyles of students in the two schools were quite different. The first school was found in the rural area and students practice rural life styles while the second school was found in urban center.

A total of 80 students 40 (20 male and 20 female) students were selected from rural secondary school and 40 (20 male and 20 female) students were selected from urban secondary school. The researcher was used disproportional stratified sampling. That means the subsamples are not proportional to their sizes in the population.

DATA COLLECTION INSTRUMENTS

Cardiorespiratory fitness was measured by1.5 mill run test; power was measured by shoot put; speed was measured by 50 m sprint run, agility was measured by zigzag run (Illinois agility run) test; flexibility was measured by sit and reach test; and muscular endurance was measured by 90° push-up test. The researcher would be contacted with selected urban and rural secondary school administrators, PE teachers, and registered officer to get permission onto test the students' physical fitness level on some selected physical fitness variables and had taken the students result from registrar office.

The student's academic performance was examined using first semester examination/test results and teacher-reported conduct grade. The researcher had taken the score of all subjects except PE, namely, Amharic language, English, mathematics, physics, chemistry, biology, geography, history, ICT, and civics which registered in 2018 academic year.

RESULTS OF THE STUDY

Result on Correlation of Physical Fitness Variables with Academic Performance

In the independent sample *t*-test, the researcher could be concluded that there was no any statistically significant relationship between the performance variables and academic performance. Even though the relationships were not statistically significant, it was better to see the way how the correlation was.

As shown in Table 1, 1.5 mile run test of cardiovascular endurance, Illinois agility test of agility, 50 m sprint test of speed, and strength endurance correlate to academic performance negatively but statistically insignificant at $r = -0.042$ and $P = 0.712$, $r = -0.109$ and $P = 0.335$, $r = -0.089$ and $P = 0.433$, and $r = -0.025$ and $P = 0.826$, respectively. That means the relationship was very weak and that may be by factors other than this physical fitness variables. The rest power and flexibility correlate to academic performance positively but statistically insignificant at $r = 0.021$ and $P = 0.856$ and $r = 0.072$ $P = 0.526$, respectively. That means the relationship was very weak and that might be by factors other than this physical fitness variables.

DISCUSSION

Several studies have documented a positive relationship between physical fitness and academic achievement or other cognitive performance measures (California Department of Education [CDE], 2001; Maynard *et al*., 1987; Shephard *et al*., 1984; Shephard *et al*., 1994). Low levels of activity and aerobic fitness are associated with declines in academic achievement (Chaddock *et al*., 2011), brain structure, cognitive abilities, and brain function (Sibley and Etnier, 2003; Castelli *et al*., 2007; Chaddock *et al*., 2010). To the contrary, several studies have documented a small relationship between physical fitness and academic achievement or other cognitive performance measures (Daley and Ryan, 2000; Dwyer *et al*., 1983).

Table 1: Correlation between selected physical fitness variables with academic performance

Variables of fitness test	Academic performance	
1.5 mile run test	Pearson's correlation	−0.042
	Sig. (two tailed)	0.712
	n	80
Illinois agility run test	Pearson's correlation	−0.109
	Sig. (two tailed)	0.335
	n	80
Sit and reach test	Pearson's correlation	0.072
	Sig. (two tailed)	0.526
	n	80
Shot put test	Pearson's correlation	0.021
	Sig. (two tailed)	0.856
	n	80
50 m print test	Pearson's correlation	−0.089
	Sig. (two tailed)	0.433
	n	80
90° push-up test	Pearson's correlation	−0.025
	Sig. (two tailed)	0.826
	n	80

However, the finding of this study differs from this agreement. Mean that there was not significance relationship physical fitness with academic performance. For this agreement, Yu *et al*. (2006) in Hong Kong, China, were study on the impact of physical activity and physical fitness on academic achievement and cognitive performance, physical activity not associated with academic achievement in either boys ($r = -0.067$, non-sig) or girls ($r = 0.068$, non-sig). Based on the finding of this study, the researcher concludes that only physical fitness cannot improve the student's academic performance, engagement to participate regular exercise and study hard, as well as interest of learning is very important to improve academic performance.

CONCLUSION

At this time, the study was indicate that 1.5 mile run test of cardiovascular endurance, Illinois agility test of agility, 50 m sprint test of speed, and strength endurance correlate to academic performance negatively but statistically not significant because $r = 0 < |r| < 0.3$. That means the relationship was very weak and that might be by other factors that could be affect this relationship. The rest power and flexibility correlate to academic performance positively but statistically insignificant because $r = 0 < |r| < 0.3$. That means the relationship was very weak and that might be by factors other than this physical variables. This finding indicates that only physical fitness cannot increase or decrease the students' academic performance. Engagement or the interest to learn and study is the main thing to increase or decrease the academic performance.

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Research Article

Comparative study on physical fitness level between rural and urban secondary school students and its impact on academic performance in Ethiopia

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ABSTRACT

In the present study, an attempt has been made to compare physical fitness components, namely, cardiorespiratory fitness, agility, flexibility, power, speed, and muscular endurance between students belonging to rural and urban set-ups and its impact on academic performance. The study was carried out on 80 students, 40 rural and 40 urban of Amanuel versus Girakidamin secondary school in Machakil Woreda. The tests were 1.5 mill run test, Illinois agility run test, sit and reach test, shot put test, 50 m sprint run test, and 90° push-up test. To gather data about the student's academic performance, the researcher had taken examination/test results and teacher-reported conduct grade which was recorded in 2018 academic year first semester from the registrar office. The researcher had taken the mean score of all subjects except PE, namely, Amharic, English, mathematics, physics, chemistry, biology, geography, history, ICT, and civics which registered first semester in 2010 E.C academic year. To compare the difference in physical fitness level between the two groups and determine the relationship between physical fitness and academic performance, the data were analyzed and compared by Statistical Package for the Social Sciences (IBM SPSS version 23). In the procedure, arithmetic means, standard deviation, and independent sample *t*-test were used to compare the data of selected physical fitness variables between rural and urban students. As a result, "*P*" value anticipated being valid either ≤0.05 on two side tests was considered statistically significant. While the relationships of the physical fitness levels with academic performance were determined by Pearson's correlation coefficients. As a result, "*r*" value anticipated being valid either ≤0.5 on two side tests was considered statistically correlated. Rural students were found to be superior in CRF, strength endurance, and power. Urban students, on the other hand, were found to be heavier and superior in flexibility and agility. However, there was no significance difference in speed. When the researcher has seen the relationship of fitness variable with academic performance in Pearson's correlation, CRF, agility, speed, and strength endurance correlate to academic performance negatively but statistically insignificant. The rest power and flexibility correlate to academic performance positively but statistically insignificant.

Keywords: Academic performance, Physical fitness, Rural and Urban

INTRODUCTION

This topic states as comparative study between urban and rural secondary school student's physical fitness level and its impact on academic performance in Ethiopia. Physical fitness has been defined by different scholars in different literature. Baltimore *et al*.., 1995, defined physical fitness as the ability of the body to perform moderate to vigorous levels of physical activity without undue fatigue and capability of maintaining such abilities throughout the life.

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American College of Sports Medicine has also defined physical fitness as a set of characteristics (i.e., the work capacity of heart and lungs, the strength and endurance of muscles, and the flexibility of joints) that relate to the ability to perform physical activities (Enter, 1997). Physical fitness is associated with a person's ability to work effectively, enjoy leisure time, be healthy, resist hypokinetic diseases or conditions, and meet emergency situation (Corbin *et al*., 2006). Every person has a different level of physical fitness which may change with time, place of work, and situation and there is also an interaction between the daily activities, and the fitness of an individual, the point if where to put the level of optimum fitness. Although physical fitness is influenced by genetics and environmental factors, physical

exercise is one of the main determinants (Andersen, 2003). Uppal and Sareen (2000) conducted a study to find out the comparison on cardiovascular fitness between rural and urban students and revealed that students with rural background performed better than that of their counterparts in urban area. Charles (2006) conducted a study on the "Differences in health for rural and urban Canadians." His report shows that Canadians living in rural areas generally have higher mortality rates than those living in urban areas. Human body is a gift by nature. Life in the computer age is not less than the blessings of God. Scientific discoveries have changed the entire face of our planet. It has changed the entire face of our planet. It has changed the thorny life into the bed of roses. Good health provides sound and solid foundation on which fitness rests and at the same time fitness provides one of the most important keys to health and living one's life to fullest. In villages which formed the first habitation of civilized man, rural sports grew out of sheer necessity. Joint defense against on sloughs of a common foe and dangerous animals must have given birth to sports such as wrestling, running, jumping, weight lifting, and such performing arts as measuring strength by holding wrists and twisting hands. Same is the case with games and sports in rural and urban settings. We notice that there is a lot of difference in the interest of children. Like we observe that in rural areas, children are indulging in minor, indigenous activities and field games such as football, hockey, wrestling, and athletics, whereas in urban, we find children playing basketball, play station, volleyball, football, table tennis, squash, watching film, etc. The main cause of difference is the availability of facilities and financial support of parents. The urban people with the growth of cities has come a great transformation in the living habits of society. The city is the hub of much social life, and it influences its standards. Intellectual growth and habits, moral codes and conditions, behavior patterns, and cultural conditions resolve around it. New communities, new group, new ethnic relations, and a multitude of classes make of the city an intricate and complex unit of modern society.

A number of studies stated that have found correlations between physical activity, physical fitness, and improved academic performance along with other cognitive performance measures. The following studies include longitudinal, cross sectional, and correlational. The California Department of Education (2002), as reported by Grissom (2005), confirmed a strong relationship between physical fitness and academic performance. Higher levels of physical fitness have been associated with higher academic achievement (California Department of Education, 2001). Similar research conducted in a school setting, observed a positive relationship between vigorous physical activity and higher academic achievement in the classroom, based on grades (Coe *et al*., 2006). Other researches have found a link between aerobic fitness to an increase in neuroelectric and behavioral performance in children (Hillman *et al*., 2005). These findings suggest that students who exhibit a greater amount of time being physically active have a greater allocation to their working memory. In addition, Sibley and Ethnier (2003) conducted a meta-analysis that confirmed a slight significant relationship exists between physical activity and cognitive performance in children. These findings confirm that physical activity may be beneficial to children's cognitive health and academic achievement. Several studies evaluated physical fitness profiles of people in different areas and understanding the relationship between physical fitness and academic achievement has been a popular subject to research. However, relatively little information was available in Machakill Woreda about physical fitness level of rural and urban area secondary school students and its impact on academic performance because urban student believed that urban students have better physical fitness than rural. On the contrary, rural students believed that rural students more physically fit than urban. In addition to this, even though several studies confirm that physical activity and physical fitness correlate with academic performance positively, the number of student believed that physical activity and physical fitness are the factors that affect decline of academic performance. According to this reason, the researcher want to compare the rural and urban students and to find out which of these two groups' are more physically fit in response to tests administered and determined the impact of physical fitness on academic performance of the students.

PURPOSE OF THE STUDY

The success and competence of any physical fitness depend on the ability of the performer to effectively achieve the given task on time. The main benefit of any research is increase in knowledge, dig out problems, and find possible solutions, the study which carried out by one researcher may be further studied and would be studied by others. Many times, this is the increase in knowledge on a specific issue. The main aim of this study was to compare physical fitness level of urban and rural secondary school students and its impact on academic performance in case of some selected secondary school in Ethiopia. In general, this study will have the following contributions:

The study was expects to contribute in the determination of student physical fitness level of urban and rural area secondary school students and its impact on academic performance. If the students who have better understanding of possible rural-urban differences in physical fitness and its impact on academic performance, profiles may fill the gap and find out possible solutions to develop their physical fitness level and academic performance. In short, this study needs to correlate the lifestyle difference on students' physical fitness variables and its impact on academic performance.

RESEARCH QUESTION

1. Is there a significance difference in physical fitness level between rural and urban area secondary school students regard to some selected physical fitness variables?
2. Is there a significance difference in physical fitness level between rural male and urban male secondary school students regard to some selected physical fitness variables?
3. Is there a significance difference in physical fitness level between rural female and urban female secondary school students regard to some selected physical fitness variables?
4. Is there a significance difference in academic performance between rural and urban student?
5. What are the relationship between physical fitness and academic performance of rural and urban secondary school students?

DESIGN OF THE STUDY

Comparative design study was used to address the current status of physical fitness level between urban and rural area secondary school students and correlation design study was employed to address the relationship of physical fitness level with academic performance of urban and rural secondary school students.

POPULATION AND SAMPLE SIZE

The researcher was selected only two secondary public schools using purposive sampling technique because the researchers believed that the two schools had the information needed for research (Malhotra, 2010). Those two schools were Girakidamin secondary school and Amanuel general secondary school. The lifestyles of students in the two schools were quite different. The first school was found in the rural area and students practice rural lifestyles while the second school was found in urban center.

A total of 80 students, 40 (20 males and 20 females) students were selected from rural secondary school and 40 (20 males and 20 females) students were selected from urban secondary school. The researcher was used disproportional stratified sampling. That means the subsamples are not proportional to their sizes in the population.

DATA COLLECTION INSTRUMENTS

Cardiorespiratory fitness was measured by 1.5 mill run test; power was measured by shoot put; speed was measured by 50 m sprint run, agility was measured by zigzag run (Illinois agility run) test; flexibility was measured by sit and reach test; and muscular endurance was measured by 90° push-up test. The researcher would be contacted with selected urban and rural secondary school administrators, PE teachers and registered officer to get permission onto test the students' physical fitness level on some selected physical fitness variables and had taken the students result from registrar office.

The student's academic performance was examined using first semester examination/test results and teacher-reported conduct grade. The researcher had taken the score of all subjects except PE, namely, Amharic language, English, mathematics, physics, chemistry, biology, geography, history, ICT, and civics which registered in 2018 academic year.

RESULTS OF THE STUDY

The finding of this result confirms that rural male and female students were significantly better than urban male and female students on 1.5 mile run test of cardiorespiratory fitness, shot put test of power, and 90° push-up test of strength endurance at 95% confidence interval ($P = 0.001 < 0.05$). On the other hand, urban male and female students were significantly better than rural male and female students on Illinois agility test of agility and sit and reach test of flexibility at 95% confidence interval, $P = 0.034$ and $P = 0.012$, respectively. On the contrary, the finding of this study revealed that there was no significant difference between rural and urban students, on 50 m sprint run test of speed at 95% confidence interval, $P = 0.23 > 0.05$ [Tables 1-3].

As shown in Table 3, rural male students were significantly better than urban male students on 1.5 mile run test of cardiorespiratory fitness, shot put test of power, and 90° push-up test of strength endurance at 95% confidence interval ($P = 0.001$, $P = 0.001$, and $P = 0.010$, respectively). On the other hand, urban male students were significantly better than rural male students on Illinois agility test of agility at 95% confidence interval, $P = 0.028$. However, there were no significant difference between rural male and urban male

Table 1: Age height and weight of the study participants

Group	No.	Age		Height		Weight	
		Mean	SD	Mean	SD	Mean	SD
Rural	40	17.6750	1.45686	1.623	0.06769	51.9275	3.28056
Urban	40	17.3250	1.2687	1.5932	0.06183	52.2100	3.14584

Table 2: Independent sample *t*-test rural versus urban male and female students

Variance of fitness test	Levene's test for equality of variances		*t*-test for equality of means						
	F	Sig.	*t*	Df	Sig. (two tailed)	Mean difference	SED	95% confidence	
								Lower	Upper
1.5 mile run test									
EVA	0.002	0.962	−6.151	78	0.000	−1.63275	0.26543	−2.16119	−1.10431
EVNA			−6.151	76.610	0 .000	−1.63275	0.26543	−2.16134	−1.10416
Illinois agility run test									
EVA	0.258	0.613	2.156	78	0.034	0.72700	0.33718	0.05572	1.39828
EVNA			2.156	76.089	0.034	0.72700	0.33718	0.05545	1.39855
Sit and reach test									
EVA	5.811	0.018	−2.564	78	0.012	−22.60000	8.81448	−40.14829	−5.05171
EVNA			−2.564	73.168	0.012	−22.60000	8.81448	−40.16656	−5.03344
Shot put test									
EVA	4.339	0.041	8.438	78	0.000	1.60750	0.19050	1.22825	1.98675
EVNA			8.438	72.070	0.000	1.60750	0.19050	1.22775	1.98725
50 m sprint test									
EVA	0.020	0.888	−1.207	78	0.231	−0.36775	0.30468	−0.97431	0.23881
EVNA			−1.207	77.987	0.231	−0.36775	0.30468	−0.97432	0.23882
90° push-up test									
EVA	0.029	0.864	3.540	78	0.001	2.75000	0.77689	1.20333	4.29667
EVNA			3.540	77.957	0.001	2.75000	0.77689	1.20332	4.29668

students on sit and reach test of flexibility and 50 m sprint run at 95% confidence interval, $P = 0.102$ and $P = 0.066$, respectively.

Table 4 indicates that rural female student was significantly better than urban female students at 95% confidence interval ($P = 0.001 < 0.05$) on 1.5 mile run test, shot put test of power, and 90° push-up test of strength endurance. On the other hand, urban female students were better than rural female students on Illinois agility test of agility, at 95% confidence interval ($P = 0.028 < 0.05$). However, in 50 m sprint test of speed and sit and reach test of flexibility, there was no significant difference between the two groups (rural and urban) female students at 95% confidence interval ($P = 0.067$ and $P = 0.062 > 0.05$, respectively).

Results on Academic Performance between Rural and Urban Male and Female Students

As shown in Table 5, there was no significance difference between rural and urban student in their academic performance. Even though the mean shows 596.77 versus 606.00, the difference was not significant at 95% confidence interval ($P = 0.640$ not below 0.05). By implication, the differences in physical variables do not have effect on academic performance.

DISCUSSION

In general, this result indicates that rural area is more comfort than urban area for the development of CRF, power, and strength endurance. For this regard, Shen and Huang, 2001; 31:81-90 observed that greater physical fitness of children had a significant relationship with larger living space and residing in rural areas. Rural area is generally linked to a more strenuous, physically dynamic way of life that is advantageous to physical fitness. On the other hand, changes in lifestyle due to living in urban settings may also affect physical fitness. Environmental and social changes related to living in urban areas such as crowding, changing neighborhood, safety worries, and inadequate grounds for play may possibly contribute to lower level of physical fitness among children (Reyes *et al*., 2003; 15:800-813). Zdirenc *et al*. (2005) also conducted a study to investigate the effects of environmental factors, lifestyle, and leisure time activities on physical fitness in rural and urban children, the percentage of urban children not involved in any sports activity was 35%, while this rate was 30.6% for rural children. It was also found that the urban children watched TV more than the rural children (13.4 ± 2.7 h/week and 10.9 ± 2.7 h/week, respectively). Watching TV for a long period of time promotes sedentary lifestyle and it may be lead to physically unfit.

Table 3: Independent sample *t*-test rural male versus urban male students

Variance of fitness test	Levene's test for equality of variances		*t*-test for equality of means						
	F	Sig.	*t*	Df	Sig. (two tailed)	Mean difference	SED	95% confidence interval of the difference	
								Lower	Upper
1.5 mile run test									
EVA	2.598	0.115	−6.010	38	0.000	−1.70350	0.28347	−2.27735	−1.12965
EVNA			−6.010	23.726	0.000	−1.70350	0.28347	−2.28890	−1.11810
Illinois agility run test									
EVA	2.910	0.096	2.282	38	0.028	0.48200	0.21119	0.05446	0.90954
EVNA			2.282	33.787	0.029	0.48200	0.21119	0.05270	0.91130
Sit and reach test									
EVA	4.483	0.041	−1.685	38	0.100	−18.15000	10.76918	−39.95106	3.65106
EVNA			−1.685	31.189	0.102	−18.15000	10.76918	−40.10849	3.80849
Shot put test									
EVA	1.100	0.301	6.820	38	0.000	2.05400	0.30118	1.44429	2.66371
EVNA			6.820	37.217	0.000	2.05400	0.30118	1.44387	2.66413
50 m print test									
EVA	0.684	0.414	−1.897	38	0.065	−0.31850	0.16791	−0.65841	0.02141
EVNA			−1.897	36.116	0.066	−0.31850	0.16791	−0.65900	0.02200
90° push-up test									
EVA	3.093	0.087	2.698	38	0.010	2.30000	0.85255	0.57410	4.02590
EVNA			2.698	34.367	0.011	2.30000	0.85255	0.56809	4.03191

EVA: Equal variance assumed, EVNA: Equal variance not assumed

Table 4: Independent sample *t*-test rural female versus urban female students

Variance of vigor test	Levene's test for equality of variances		*t*-test for equality of means						
	F	Sig.	*t*	Df	Sig. (two tailed)	MD	SED	95% confidence	
								Lower	Upper
1.5 mile run test									
EVA	11.386	0.002	−6.799	38	0.000	−1.56200	0.22974	−2.02709	−1.09691
EVNA			−6.799	25.853	0.000	−1.56200	0.22974	−2.03437	−1.08963
Illinois agility run test									
EVA	0.207	0.652	2.279	38	0.028	0.97200	0.42646	0.10867	1.83533
EVNA			2.279	37.986	0.028	0.97200	0.42646	0.10866	1.83534
Sit and reach test									
EVA	2.631	0.113	−1.921	38	0.062	−27.05000	14.08246	−55.55845	1.45845
EVNA			−1.921	37.056	0.062	−27.05000	14.08246	−55.58232	1.48232
Shot put test									
EVA	4.236	0.046	5.585	38	0.000	1.16100	0.20787	0.74019	1.58181
EVNA			5.585	33.552	0.000	1.16100	0.20787	0.73835	1.58365
50 m sprint test									
EVA	1.095	0.302	−1.888	38	0.067	−0.41700	0.22087	−0.86412	0.03012
EVNA			−1.888	36.205	0.067	−0.41700	0.22087	−0.86485	0.03085
90° push-up test									
EVA	0.318	0.576	3.654	38	0.001	3.20000	0.87585	1.42694	4.97306
EVNA			3.654	37.959	0.001	3.20000	0.87585	1.42688	4.97312

Table 5: Group statistics and independent samples test between rural and urban male and female students

Group statistics							
	Rural and urban residence		*n*	Mean	SD	SEM	
Academic performance	Rural		40	596.7750	104.79320	16.56926	
	Urban		40	606.0000	67.04648	10.60098	
	Levene's test		*t*-test for equality of means				
	F	Sig.	*t*	Df	Sig. (two tailed)	Mean difference	SED	95% Confidence interval of the difference	
								Lower	Upper
Acc. Per.									
EVA	3.867	0.053	−0.469	78	0.640	−9.22500	19.67031	−48.38558	29.93558
EVNA			−0.469	66.346	0.641	−9.22500	19.67031	−48.49422	30.04422

The findings that the RURAL students was significantly better in cardiorespiratory fitness, power, and muscular endurance compared to URBAN students may be due to the fact that the students belonging to rural area performs various extra activities walk to school, market, fetching water, watching the caw, cultivation, and various types of play (cultural sport) such as Gena, wrestling, and regular physical activity. The easy livelihood condition or lake of physical activity in the urban students like watching media/TV, using the car/taxi for transportation, using computer, internet, face book for a long period of time due to the facts of the findings. The use of media from TV, computer, and internet has become one of the most important things in our daily life because of its contents in all fields.

CONCLUSION

In preceding section, the main findings of the study have been summarized in line with its objectives, based on the result, the following conclusions were made: The finding of this result confirms that rural male and female students were significantly better than urban male and female students on 1.5 mile run test of cardiorespiratory fitness, shot put test of power, and 90° push-up test of strength endurance at 95% confidence interval ($P = 0.001 < 0.05$). The same to that rural female student was significantly better than urban female students on 1.5 mile run test of endurance, shot put test of power, and 90° push-up test of strength endurance at 95% confidence interval ($P = 0.001 < 0.05$). And also, rural male students were significantly better than urban male students on 1.5 mile run test of cardiorespiratory fitness, shot put test of power, and 90° push-up test of strength endurance at 95% confidence interval ($P = 0.001$, $P = 0.001$, and $P = 0.010$, respectively).

On the other hand, urban male and female students were significantly better than rural male and female students on Illinois agility test of agility and sit and reach test of flexibility at 95% confidence interval, $P = 0.034$ and $P = 0.012$, respectively. The same to that urban male students were significantly better than rural male students and urban female students who were significantly better than rural female students on Illinois agility test of agility at 95% confidence interval, $P = 0.028$.

On the contrary, the finding of this study revealed that there was no significant difference between rural male and female versus urban male and female students, between rural male versus urban male students and rural female versus urban female students on 50 m sprint run test of speed at 95% confidence interval, $P = 0.23$, $P = 0.066$, and $P = 0.67$, respectively. The same to that this finding indicates that there was no significant difference between rural male versus urban male students and rural female versus urban female students on sit and reach test of flexibility at 95% confidence interval, $P = 0.102$ and $P = 0.062$, respectively.

As shown this finding, the researcher concludes that rural area is more comfort than urban area for the development of physical fitness. It might be regular energetic activity/ active lifestyle is available in rural residence. Because village lifestyle better active in nature than the life in urban areas, which produced high level of physical and physiological functioning in rural residents. On the other hand, urban students were significantly better than rural students on Illinois agility test of agility and sit and reach test of flexibility. The way of daily life activity levels strength regular activity might be impacts on the development of flexibility and agility. And also, there was no significant difference between rural and urban students on 50 m sprint test of speed. The finding of this study also confirms that there was no significance difference between rural and urban student in their academic performance at 95% confidence interval, $P = 0.640$ not below 0.05. By implication, the differences in physical variables do not have effect on academic performance. Even though the relationships were not statistically significant, it was to see the way how the correlation was.

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Research Article

Locked down at home during coronavirus: Physical exercise changes in students and teachers in Spanish high school

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ABSTRACT

The arrival of coronavirus produced a lot of changes in some societies. One of them was that people stayed confine at home during some weeks and months. This situation changed a lot of life's routines. Physical activity was one of them. This article presents a confine change in the physical exercise in Spanish high school students and teachers. The study recovers the information after 1 month locked down. We could find that some routines were changed as the frequency, the length, the kind of practice activities, the person with whom did exercise, etc. Students and teachers adapted their physical activities to this circumstance. Between the research data, we emphasize that people followed doing a physical exercise (more frequency but fewer length), especially physical condition activities, alone and with their families. We differentiated students and teachers result.

INTRODUCTION

With the coronavirus crisis, some governments decide to confine people for preventing infections. This confinement could have effects on the people, especially in the younger and elder people.

In Spain, on March 13th, the Spanish Government decided to declare the alert state. With this status, all the people had to stay at home. Only was allowed the fundamental activities: Military activities, health workers, supermarkets workers, pharmacies, and so on. Schools were closed and all the students had to stay at home. It was a new situation never produced before and opened a lot of possibilities about to study of physical exercise.

It could have an effect about mental and physical health. Nieman (1998) recommendered that physical activities are very important to reduce the illness and the mental health.

Obesity higher is a problem and it has a big relation with physical activities. If people reduce the caloric expenditure of the work and they increase diet calories, their height will be increased. It is a phenomenon more common in young and adult people (Prentice and Jebb, 1995 and Bouchar and Blair, 1999).

Marcos Becerro and Galiano (2003) studied the effects of the deficiency of physical activities and the cardiovascular system. It is an important risk factor.

Barcelona Global Health Institute (ISGlobal)[1] report explains that physical activity was reduced by 38% during one confine week. Moreover, April 18th, Spanish people walked 90% less in comparison to January 13th. They used electronics device for studying these movements.

For knowing the effects of the confine on high school students and teachers, we chose a high school in Spain for testing the opinion to the students and teachers about their physical activity during the confine.

With this study, we can offer to the students and teachers' physical activities for keeping your physical condition and their mental health.

Statement of the Problem

The aim of the studies to know the physical exercise practice before the confine and during the confine. With it, we can adapt the lessons to the students and we can offer activity/activities to teachers and students in this period.

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RESEARCH METHODOLOGY

For doing the research, we chose a sample and did a form with different questions about the physical exercise before locked down and during it.

We had to distinguish the physical activity of physical exercise. Physical activities are all the everyday activities that they need a movement of physical action. For example, walking to the school, climbing the stairs, going to work with a bicycle, etc. The purpose of them is not to do exercise.

With physical exercise, we want to refer us to voluntary activities for maintaining or improving physical condition or get fit. For example, walking on the mountain, running around the town, fitness activities, etc. Furthermore, we have included sports.

The study sample was Maestrat High School students and teachers. This school is located in Sant Mateu, Castellon (Spain). They found 414 students and 60 teachers. They were divided into three sections:

- Secondary Obligatory students: 323 students
- A level: 71 students
- Professional training studies: 20 students.

We created a form with Google forms application. Questions in the form were divided into three sections:

Questions and possibilities from the 1st section questionnaire:

1.1. Which is your group? Teacher, student, family, and other
1.2. Which is your course? 1st, 2nd, 3rd, and 4th of obligatory secondary school, 1st, 2nd of high school and formative studies.

In the 2nd section of the form, we ask about the physical activity and sport before the confine. Questions from the 2nd section questionnaire are as follows:

2.1. How many weekly days do you practice physical exercise or sport? Any days; 1 or 2 days; 3 or 4 days; and more than 5 days.
2.2. How many weekly hours do you practice physical exercise or sport? Any hour; between 1 and 3 weekly hours; between 4 and 6 h; between 7 and 9 h; and more than 10 h
2.3. What kind of exercise do you do before the confine? Physical condition activities; gymnastics activities; corporal expression or dance; individual sport; team sport; relaxation activities, motor games, other skills; and any exercise.
2.4. Do you play a federate sport? Yes or not
2.5. Before the confine, I did physical exercise alone; with my family, with my friends; I did not play physical exercise.
2.6. Which is the reason for you doing physical exercise? For improving health; for body beauty; for occupying free time; for doing social relationships; for developing the social prestige; and for the living of it in the future.

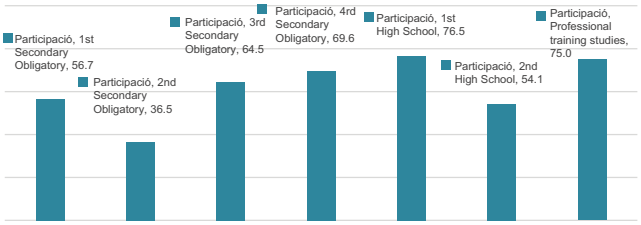
In the 3rd section, we asked questions about physical exercise during the confine. We repeated the questions 2.1; 2.2; 2.3; 2.5; 2.6, and we also others as:

During the confine: I increased the days of physical exercise; I reduced the days of physical exercise; and I kept the days of physical exercise. During the confine: I increased the hours of physical exercise; I reduced the hours of physical exercise; and I kept the hours of physical exercise.

Finally, we asked with an open question which is the major changes in their life about the physical exercise. The form was sent on April 6th, coinciding with World Physical Activity Day. It was the 24 day of the confine and we finished data collection on April 13th (31 days after at the begin of the confine). In this time, the people were confined yet. All the students and teachers were free to participate in the study. We have to explain that the study did not consider 2 h of physical education lessons that the secondary obligatory studies and 1st of high school do in the school year.

RESULTS AND DISCUSSION

Information about the students. The sample was 414 students. On April 13th, we obtained 244 complete forms. After this day, we received more forms, but they were not considerate in the study. Students participation was 58 % of students sample.



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Research Article

Health education in Chinese universities: Status quo, problems, and countermeasures

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ABSTRACT

Purpose: The purpose of this study was to investigate the development of health education in Chinese colleges and universities and to analyze the factors that affect the development of the curriculum. Research Methods are as follows: Literature, questionnaire, qualitative interview, and participation observation. The research group selected 30 universities in mainland China to investigate 1380 samples of college students and 30 college staff. Results are as follows: (1) Fewer health education courses are offered in universities in mainland China, (2) there are very few health education teachers in Chinese universities, (3) lack of channels for college students to acquire health knowledge, (4) Chinese universities do not attach importance to health education as a whole, and (5) the country lacks an effective supervision mechanism to further restrict colleges and universities. Research suggestions are as follows: (1) The state should formulate legislation on health education in colleges and universities as soon as possible, (2) strengthen the health awareness of teachers and students in Chinese universities, (3) strengthen the teacher training of college students' health education courses, (4) build a health education curriculum system in colleges and universities, and (5) strengthen the construction of a healthy campus culture.

Keywords: Chinese colleges and universities, Health courses in Chinese university, Health education

INTRODUCTION

They are often skipping classes, learning fatigue, getting up all day, playing games all night, drinking late at night, not having breakfast, exercising very little, having relationships with roommates, mentally naive, and feeling tired..... This phenomenon is very common among college students in China (Huang and Wu, 2019). Unhealthy lifestyles, such as lack of health consciousness, lack of health management ability, lack of daily exercise, irregular sleep and rest, and unreasonable diet, there are becoming a risk factor affecting the health of Chinese college students (Wang, 2018). "China youth sports development report (2015)" display: China students' physical health problems are still prominent, overweight and obesity are serious, the incidence of myopia continues to increase, speed, and strength quality growth tends to stagnate, endurance, and flexibility to low scores, blood pressure regulation dysfunction is common (Tian and Cheng, 2016). According to the latest data released by the National Bureau of Statistics and the Ministry of Education, there are 2889 colleges and universities in mainland China by 2019, and the number of college students is about 38,330,000. The physical health problems of college students have not been improved for many years, and the unscientific lifestyle of college students is outstanding. Health education can be through a variety of means, plan, and purpose, organized to enable students to master the knowledge of health, which is beneficial to develop personal, collective and social healthy lifestyle and behavior, and promote all-round development of students' physical and mental health and moral health and social adaptability (Yang, 2018). This is an integral part of the overall quality education for college students. Health education is an important component of the quality education of college students. However, the study shows that the present elective course or the form of the lecture is a common health education model in Chinese colleges and universities (Liang and Li 2012). Most of the courses in some universities teach sports-related theories rather than health education contents, failing to achieve the purpose of health education for college students.

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THE SIGNIFICANCE OF SETTING UP HEALTH EDUCATION COURSES IN CHINESE COLLEGES AND UNIVERSITIES

Health is the sign of the quality of life. Health as the foundation of life and the foundation of life is of great significance and value for successfully completing academic work, achieving career, achieving life ambition, and enjoying a good life. On July 9, 2019, the document "healthy China action (2019–2030)" issued by the "Healthy China Action Promotion Committee" of the Chinese government pointed out that everyone is the first person responsible for their own health. The local government should bring the physical health of college students into the assessment and evaluation of colleges and universities. On September 29, 2019, the Ministry of Education of the people's republic of China issued the opinions on deepening the reform of undergraduate education and teaching and comprehensively improving the quality of personnel training. The document requires that colleges and universities should strengthen the assessment of students' physical education courses. If the score of physical health tests is lower than 60 points, students will not be able to obtain the graduation certificate. The goal of the Chinese government is that by 2022 and 2030, the proportion of urban and rural residents who have reached the standard of national physical fitness measurement is not <90.86% and 92.17%, respectively, and the proportion of people who regularly participate in physical exercises is 37% and more and 40% and more.

With the Chinese government's strategic goal of building "first-class universities and first-class disciplines," it is the new mission of Chinese universities to train high-quality talents to adapt to the economic and social development in the new era and cultivate qualified talents. A healthy body and a scientific way of life are an important part of cultivating talents in universities and the main standard to measure the quality of talents. The core content of health education for college students is to impart health knowledge, establish health behavior, and improve the environment. Carrying out health education in a planned, purposeful, and evaluation way can enhance college students' health knowledge, help students consciously choose healthy behaviors and lifestyles, establish modern health awareness, promote physical and mental health, and improve their quality of life (Shi, 2002). In recent years, although colleges and universities in China have done some work in carrying out health education for college students and improving their health literacy, they have made some achievements, but in general, they are still in the exploratory stage. It is imperative for college students to grasp health knowledge and skills, enhance their health literacy and health management skills, and improve their quality of life (Kang and Li, 2019).

THE HISTORICAL BACKGROUND OF HEALTH EDUCATION IN CHINESE COLLEGES AND UNIVERSITIES

Relevant Documents Issued by the Chinese Government

The Chinese government has been very concerned about the health of young people. Since the founding of new China in 1949, the Chinese government has issued a series of physical exercise documents, the purpose of which is to carry out health intervention to students through school education. The main motivation of the above series of legal documents issued by the competent authorities of the Chinese government is to require colleges and universities to pay attention to the physical and mental health of college students in the form of laws. Especially since Xi Jinping came to power, the state has attached more importance to the health problems of young students. In the "Outline of the building of a strong sports country," the grand goal of sports is to establish "sports can become a landmark cause for the great rejuvenation of the Chinese nation." This is the first time in official documents of the Chinese government.

Analysis of Health Education Documents in Colleges and Universities

Over the years, China's Ministry of education has set up a sports and health course in middle schools and primary schools and has opened a public sports compulsory course in colleges and universities, aiming at strengthening the physical health of Chinese teenagers. The study found that the health status of Chinese college students is very poor, and many health indicators are lower than those in western developed countries (Sun and Zhang, 2013). On July 11, 2017, the Ministry of Education of China issued the "Guidance Outline on Health Education for Chinese Universities," which states, the content of health education in colleges and universities mainly includes healthy lifestyle, disease prevention, mental health, sexual and reproductive health, safety emergency, and hedging five aspects.

PROBLEMS IN HEALTH EDUCATION IN CHINESE COLLEGES AND UNIVERSITIES

Government Policies and Regulations are Not Implemented

Over the years, the Chinese government attaches great importance to the health of college students, promulgated a number of legal documents to be protected, but the effect is not satisfactory (Wang, 2017). Although China has formed a relatively complete system of national education, but the scientific and reasonable curriculum knowledge system are not perfect, the lack of college health education courses is a good

proof. The Ministry of Education promulgated the "Guidance Outline," which is not a legal document but merely a document under the guidance that does not have mandatory attributes. As the survey shows, universities are likely to implement issues that may or may not be implemented.

University Principals Pay Insufficient Attention

In the promotion of "double first-class" construction in colleges and universities by the Chinese government, they proposed the slogan of training qualified personnel and encouraging technological innovation. All colleges and universities actively corresponding to this strategy have put forward construction plans. According to the author's survey, there is no clear definition of the standards for training qualified personnel in colleges and universities. A frail, mentally unhealthy college students, is not qualified personnel? For this question, it seems that the headmaster of higher education should answer the question clearly or not. What are healthy people? People point of view is that, as long as, they are not sick, they can run healthily without jeopardizing public safety. University presidents are generally experts in a subject area, not an educator. As a result, great attention has been paid to the development of undergraduates "professional fields in college personnel training, neglecting students" physical, and mental health problems. Under the management system of universities and colleges in China, principals do not pay attention to certain things and are often hard to enforce.

College Health Education Curriculum Teachers Lacking

Through field survey and web-based literature search, the researchers found that there are basically no professional teachers for health education in the 30 universities surveyed. There are very few colleges and universities nationwide that have special education for health education. The reason for this survey result is that, in addition to the above-mentioned lack of supervision and neglect of principals, the more direct reason is that there is no health education major in the system of teacher education in higher education institutions in China. As previously analyzed, the university health education curriculum requires multiple interdisciplinary supports; the average teacher cannot meet this requirement. In addition, this course will spend a lot of preparation time, many teachers are reluctant to invest too much, and the entire lack of teachers is not difficult to understand.

The Lack of Hardware Required for the Course Opening

"Guidance Outline for Health Education in Colleges and Universities of China" requires that the main contents of health education in colleges and universities include five aspects: Healthy lifestyle, disease prevention, mental health, sexual and reproductive health, and safety emergency and risk avoidance. The teaching of this course is not only to teach theoretical knowledge but also to equip with necessary hardware. Such as the assessment of the health level of the test apparatus, the model of the display of human anatomy, the equipment used in outdoors first aid, and so on. In the course of teaching, the necessary equipment and equipment are seriously deficient, which directly affect the normal development of the teaching work. In recent years, China's investment in the construction of colleges and universities is increasing, and colleges and universities are also doing their best to develop the ability of scientific and technological innovation. With the input of a "public elective course," most colleges and universities decision-makers will not agree with the hardware input.

SUGGESTIONS ON HEALTH EDUCATION IN CHINESE COLLEGES AND UNIVERSITIES

Need Policy Support and Legal Supervision

The Chinese government should take the form of legislation and require colleges and universities to set up a health education course for college students. Every graduate's health index system must conform to the basic standards; otherwise, they will not graduate. Since the 18th National Congress of the Communist Party of China, Xi Jinping, the Central Committee of the Communist Party of China, has promoted "healthy China" into a national strategy. For many years, the state has always attached great importance to the health education of college students.

On October 25, 2016, China's State Council issued the "Health China 2030 plan," calling for, "strengthening health education" and increasing school health education. Health education is incorporated into the national education system and health education is regarded as an important content of quality education at all stages of education. The government should cultivate the teachers of health education and bring health education into preservice education and post-vocational training of PE teachers.

University Recruitment of Professional Teachers and Hardware Equipment

Teachers are aiming at the reality of the lack of health education teachers in China's universities. The state supports the establishment of "health education" undergraduate and master's degree and alleviates the shortage of teachers in colleges and universities. Under the coordination of the educational administration department, the colleges and universities encourage the cooperation between the physical education teachers and the doctors in the school hospitals and jointly undertake the curriculum of health education. Universities should recruit teachers in the field of health education in society or cooperate with "third party" social institutions.

Construction of Health Education Curriculum System

The health education is carried out in the university which is a special time range for university students, through publicity and education, to teach students about the life of health knowledge and skills, shaping up healthy natural environment and harmonious humanistic environment, to cultivate the students' consciousness of health, good health, health behavior and mentality habits, to enable students to achieve all physical and mental health and overall development of a purposeful, and organized educational process.

According to "Guidance Outline for Health Education in Colleges and Universities of China," the main contents of health education in colleges and universities include five aspects: Healthy lifestyle, disease prevention, mental health, sexual and reproductive health, and safety emergency and risk avoidance. These aspects should not be a simple piecing together. It should be proved through professional demonstration to form a complete set of health education curriculum system. The ministry of education of the Chinese government should also set up a unified curriculum standard as soon as possible, and the universities should strictly implement it.

University Should Guide College Students to Pay Attention to Health Education

Health education can enable college students to set up a comprehensive view of health and establish a consciousness of prevention and self-health. The core of health education is to make individuals or groups change their unhealthy behavior and lifestyle, especially the change of organizational behavior. Of course, changing behavior and lifestyle are an arduous and complicated process. A lot of bad behavior is not personal responsibility nor does it have a personal desire to change. Because many bad behaviors or lifestyles are influenced by social customs, cultural backgrounds, economic conditions, health services, and so on.

Strengthening the Construction of College Campus Health Culture

We should strengthen the construction of campus culture, create, and optimize the environment of University's environment and mental health education, and create a good psychological and social environment for the healthy growth of college students. The healthy growth of college students cannot be separated from a healthy psychosocial environment, and the cultivation of college students' psychological quality cannot be separated from a good campus cultural atmosphere. The school style is an important part of the construction of campus culture, and it is also an important condition for the development of students' mental health. A good school spirit will imperceptibly optimize the psychological quality of students, help people maintain harmonious interpersonal relationships, facilitate communication and help each other, and form a relaxed and orderly amateur living environment. The colorful campus cultural activities help to cultivate the students' optimistic attitude of life and the emotional characteristics of health and pleasure.

The cultivation of College students' health awareness is related to the students' personal physical quality, the fundamental purpose of college education, and the big problems of the future of the Chinese nation. Health education can make students obtain the necessary health science knowledge, establish the correct health value, develop good learning and life style, and change the unhealthy environment, so as to achieve the prevention and treatment of diseases, enhance physical fitness, and promote all-round development, major initiatives to lay the foundation for lifelong health.

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Research Article

Perceived training load and soccer specific speed performance

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ABSTRACT

The study was conducted to unveil how perceived training load (TL) relates with soccer specific linear sprinting speed and change-of-direction speed (CODS). To this end, it was hypothesized that perceived TL could not have a significant level of correlation with both linear sprinting speed and CODS. The hypothesis was made with a due acknowledgment that speed related qualities are better attributed to genetic makeup or endowed muscle fiber qualities. Competitive soccer players who were playing at third level of the nation's league participated in the study. The number of the players who completed the study protocol was 88. Perceived TL, linear sprinting speed, and CODS were measured for 5 consecutive weeks during the first phase of the competition period. TL was calculated using s-RPE, which involves rating by the players'. The players rate their perceived feeling about how hard the session was 25-min right after the end of each session. This was done for about 5 consecutive weeks. Sprinting speed and CODS were measured weekly for 5 consecutive weeks. Thus, for each variable there were 440 observations for analysis. Using these data the analysis was made using bivariate correlation and partial correlation. The study showed that when linear sprinting speed had a small zero-order correlation (r (440) = −0.292, $P < 0.001$) and non-significant partial correlation with TL, CODS showed a moderate bivariate correlation (r (440) = −0.350, $P < 0.001$) and a significant partial correlation (r (437) = −0.202, $P < 0.001$). Thus, CODS is relatively trainable quality than speed. Linear sprinting speed is found to be training resistant quality. Thus, linear sprinting ability might be accounted Moreto genetic endowed attributes and maturity.

Keywords: Change-of-direction, Linear sprinting, Perceived, Speed

INTRODUCTION

Considering the invaluable role of speed and speed related qualities, a lot can be done. As part of seeking speed or speed related quality talent identification even should pay a due emphasis on speed ability (Dodd and Newans, 2018). A lot of scientific publications confirmed that speed is among the most critical fitness quality at any phase of the game (Faude *et al*., 2012). The action of defending or attacking situations can be handled effectively if the players possess good sprinting ability. Most of those world class players in the contemporary soccer are highly equipped with these qualities. Ronaldo *et al*. are well known for their astonishing speed quality. As a result, a lot of experimental researches examining the effect of varied training regimens and approach are carried out. For example, Tous-Fajardo *et al*. (2016) studied how functional inertial eccentric overload and vibration training enhance soccer specific speed and change-of-direction speed (CODS). This study showed that isoinertial eccentric-overload and vibration training once in a week can improve linear speed and CODS. However, the entire training load (TL) of the week including all other soccer specific training and non-specific trainings is not considered, though the adaptation which occurs is the cumulative effect of the total bodily homeostatic disruption. In general, regardless of this, straight-line sprinting velocity, agility, and repeated-sprint ability are physical fitness which are capable to distinguish groups from different performance levels (Haugen *et al*., 2014). Professional players have become faster over time, indicating that sprinting skills are becoming more and more important in modern soccer (Haugen *et al*., 2014). Soccer players may benefit more by performing sprint-training regimens similar to the progression model used in strength training and by world-leading athletics practitioners, compared with the majority of guidelines that traditionally have been presented in research literature (Haugen *et al*., 2014).

It is clearly indicated that the game is becoming more demanding in terms of high-intensity running distance, number of high intensity actions, sprint distance, and number of sprints (Barnes *et al*., 2014). Hence, as to cultivate this quality or to get

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this fit player, talent identification and provision of appropriate training are recommended (Beato *et al*., 2018; Haugen *et al*., 2014; Negra *et al*., 2018). Therefore, training which is also geared toward improving the important qualities is believed to be one factor (Beato *et al*., 2018; Haugen *et al*., 2014; Negra *et al*., 2018; Tous-Fajardo *et al*., 2016). The other factors as maturity (age and genetic make-up) can greatly impact it (Di Mascio *et al*., 2017; SelmiSassi et al., 2018). Although adequate workload is seen as a prerequisite to improve player's performance or fitness in general (Malone *et al*., 2017; Malone *et al*., 2018), how much TL is optimal is not straightforward for practitioners. Thus, the relationship of TL with these crucial qualities is not that elucidated. Some of the studies done on the area showed inconsistent findings. Some claimed that higher TL and fitness are inversely related (Cross *et al*., 2016; Malone *et al*., 2017a), while others associate TL with positive outcome (Brink *et al*., 2010; Gabbett, 2016). Basically, little is known about the impact of load imposed on players and the changes in fitness across a season (Haugen, 2018). Therefore, the study was done with a prime purpose of how perceived TL relates with linear sprinting speed and CODS.

METHODS

A correlational approach with bivariate and partial correlation was used in the study. From the third league (national league), a total of 88 players participated in the study. Perceived weekly TL was calculated using s-RPE (Borgs-10). In each session, 25 min after the end of the session the players rated their perceived exertion level on the scale. Then, TL calculated by multiplying the scale (number as rated by the players) by the duration of the session (in minute). The sum of all the loads in each week was taken as weekly TL. The measurement of linear sprinting speed was done using 40-m dash and three trials for each participant (with 8–10 rest between trials). Out of the three trials the best time was taken for further analysis. The same procedure was used for CODS (9-3-6-3-9) test. This way, the fitness test and TL measurement were done weekly for about 5 consecutive weeks. Thus, a total of 440 observations (measurement) were conducted.

RESULTS

TL and Linear Sprinting Speed

Perceived weekly TL had a small to moderate significant negative relationship with linear sprinting speed and CODS $P < 0.001$ [Table 1]. TL significantly correlated with the players linear sprinting speed r (440) = −0.292, $P < 0.001$. The result revealed that the higher the perceived TL, the smaller the time taken to cover the 40-m dash. And also, higher perceived weekly TL was significantly associated with a greater CODS performance r (440) = −0.350, $P < 0.001$. This meant that when players have a higher perceived weekly TL, they were likely to finish the CODS test with smaller time. TL had a small significant relationship with linear sprinting speed and a moderate significant relationship with CODS performance of the players.

The Correlation of TL with Speed and CODS after Controlling Moderating Variables

The correlation between TL and linear sprinting speed, which was significant with the zero-order correlation, was not found when the association is examined after controlling the effect of CODS. Thus, the moderating effect of CODS on the relationship of TL with speed is great.

The correlation between perceived TL and CODS is still significant after controlling the effect of linear speed r (437) = −0.202, $P < 0.001$. Thus, the effect of speed on the association of TL with CODS was not that great to an extent to make it non-significant. However, the magnitude of the relationship was altered by speed as the correlation coefficient drops from −0.350 to −2.202 [Tables 2 and 3].

DISCUSSION

Linear sprinting speed and CODS are highly related physical qualities (Spittle *et al*., 2013). Moreover they both are dependent on maturity level of the players (Bishop *et al*., 2019; De Mascio *et al*., 2017; Selmi *et al*., 2018). The basic

Table 1: The bivariate correlation of TL with speed and CODS

Controlled variables		Speed	CODS
TL	Pearson correlation	−0.292**	−0.350**
	Sig. (two-tailed)	0.000	0.000
	n	440	440

CODS: Change-of-direction speed, TL: Training load

Table 2: The partial correlation of TL with speed

Controlled variables			Speed
CODS and	TL	Correlation	−0.013
		Significance (two-tailed)	0.790
		Df	437

CODS: Change-of-direction speed, TL: Training load

Table 3: The partial correlation of TL and CODS

Control variables			CODS
Speed	TL	Correlation	−0.202
		Significance (two-tailed)	0.000
		df	437

CODS: Change-of-direction speed, TL: Training load

fact in relation with TL in sport is that, the ability of players or athletes to tolerate TL highly depends on their maturity level. This means that, as maturity peaks the players' capacity to tolerate higher training load improves. Therefore, the effect of maturity to withstand higher TL and the subsequent adaptation for training exposure can immensely impact speed and CODS performance. Here with this study, the small bivariate and non-significant partial correlation of TL with linear sprinting speed can however be accounted to the un-trainability of speed (i.e., it relies more on genetic make-up). The finding in this regard with this study otherwise is too convincing.

To an extent, CODS relies on some other qualities as perception, movement control, and techniques in relation with foot placement and stride adjustment (Spittle *et al*., 2013; Shepard *et al*., 2014; Young *et al*., 2015). These technical qualities are believed to be highly trainable through specifically designed training regimens. Still the effect of strength on CODS performance is highly acknowledged (Spittle *et al*., 2013; Young and Montgomery, 2002), which can be improved through strength training. The finding with this study also goes in parallel with these findings. The moderate level of correlation between perceived TL and CODS performance indicated the relative trainability of CODS than linear sprinting speed.

CONCLUSION

The relationship of perceived TL with linear sprinting speed in soccer specific test protocol is small. The relationship of TL with speed is also highly susceptible for CODS as a moderator. Thus, it is argued that linear sprinting speed is a TL resistant fitness element to an extent.

The association of CODS with the level of weekly TL is moderate. Although the effect of the moderating was controlled, the relationship was significantly existent. This means that CODS is relatively sensitive and responsive to TL soccer specific fitness quality.

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Research Article

Changes in physical fitness of students at Nghe An College of Economics

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ABSTRACT

The purpose of this study was to investigate the changes of specific indexes on morphology, cardiovascular endurance, and physical fitness of students. After 1 year of training physical education curriculum, physical fitness of students was remarkably improved; cardiovascular endurance was also significantly improved. There were no significant variations in height and weight. Current physical education curriculum was a beneficial vehicle to enhance physical fitness of students.

Keywords: Economics, Function, Physical education, Physical fitness

INTRODUCTION

Regular participation in various exercises increases physical fitness. Physical education develops students' competence and confidence to take part in a range of physical activities that become a central part of their lives, both in and out of school, and plays an important role for enhancing general physical and mental health of people. Physical education is not only beneficial for physical health but also for academic improvement of students.[1,2] A high-quality physical education curriculum enables all students to enjoy and succeed in many kinds of the physical activity. They develop a wide range of skills and the ability to use tactics, strategies, and compositional ideas to perform successfully. In this study, specific indexes on morphology, cardiovascular endurance, and physical fitness of students were investigated after 1-year school.

METHOD AND DESIGN

This was a pre- and post-comparison. 250 fresh year students were recruited and participated in this study. Subjects included 100 males and 150 females, aged 18.3 ± 0.7 years, practiced physical education lessons of curriculum which assigned by Ministry of Education and Training. Data of tests were taken at the beginning (pre-test) of school year of fresh students and after 1 year practicing and data were taken again at the end of school year (post-test).

Physical education curriculum included (prescriptions and options): General theory of physical education, badminton, sprint, high jumping, volleyball, eurhythmics, football, and martials arts, and table tennis (options). All these sports have been being taught in Nghe An College of Economics, Vietnam.

Statistical Analysis

To determine the significant differences of physical fitness level between pre-test and post-test, the data were analyzed and compared by SPSS software. Standard deviation and independent "*t*" test were used to compare the data. As a result, "*t*" values anticipated to be valid either less than or greater than 0.05 on two-sided tests were considered statistically significant.

Outcome Measurement

To assess the changes in physical fitness of students, the following tests were selected as outcomes measurement [Table 1].

These above tests were selected by lecturers, expert who work in the field of physical education and sports.

RESULTS

The results of Table 2 showed that there were no significant differences in standing height and weight for both male

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and female students with $P > 0.05$, whereas, cardiovascular endurance of male and female students was better significantly improved with $P < 0.05$.

The results of Table 3 showed that there were better performances in all physical tests. There results proved that isometric strength of the hand and forearm muscles, abdominal

Table 1: Purposes of selected tests for assess the changes in morphology, cardiovascular endurance, and physical fitness of students

Test	Purposes of measurements
Standing height (cm)	To measure standing height growth
Weight (kg)	To measure weight growth
Cardiovascular endurance (Ruffier test)	Ruffier test is cardiovascular endurance test, which involves measuring heart rate before and after performing 30 squats in 45 s.[3,4] From the results of this squat test, cardiorespiratory fitness can be classified.
Hand grip (kg)	To measure the maximum isometric strength of the hand and forearm muscles
30 s sit-ups (times)	To measure abdominal muscular strength and endurance of the abdominals and hip-flexors, important in back support and core stability
Standing long jump (cm)	To measure the explosive power of the legs
30 m sprint (s)	To determine acceleration and speed
4×10 m shuttle running (s)	Test of speed, body control, and the ability to change direction (agility)
Toe touch (cm)	To measure the flexibility of the lower back and hamstring muscles.
5-min free running (m)	Measure the endurance

Table 2: Changes in morphology and functions of students

Test	Gender	Pretest		Posttest		*P* value
		Mean	SD	Mean	SD	
Standing height (cm)	Male	165.10	6.01	165.70	5.22	>0.05
	Female	154.90	5.41	155.02	5.03	>0.05
Weight (kg)	Male	54.35	5.64	55.00	5.87	>0.05
	Female	46.75	5.74	47.10	5.25	>0.05
Cardiovascular endurance	Male	8.72	2.12	8.32	2.02	<0.05
	Female	8.84	2.20	8.42	2.04	<0.05

Table 3: Changes in physical fitness of students

Test	Gender	Pre-test		Post-test		*P* value
		Mean	SD	Mean	SD	
Hand grip (kg)	Male	43.24	5.33	46.44	5.42	<0.05
	Female	31.22	4.02	34.12	4.62	<0.05
30 s Sit-ups (times)	Male	21.00	3.94	24.00	4.53	<0.05
	Female	12.00	4.31	14.00	4.36	<0.05
Standing long jump (cm)	Male	225.00	19.25	236.50	20.93	<0.05
	Female	157.27	20.56	165.27	21.94	<0.05
30 m running (s)	Male	4.71	0.52	4.47	0.65	<0.05
	Female	6.09	0.64	5.74	0.54	<0.05
4×10 m shuttle running (s)	Male	10.55	1.03	10.09	1.23	<0.05
	Female	12.64	1.14	12.04	1.16	<0.05
Toe touch (cm)	Male	11.83	4.64	11.21	5.02	<0.05
	Female	13.91	4.51	13.19	4.81	<0.05
5 min free running (m)	Male	991.00	97.00	1046.00	111.00	<0.05
	Female	798.00	101.00	847.00	112.00	<0.05

muscular strength and endurance of the abdominals and hip-flexors, explosive power of the legs, acceleration and speed, speed, body control, and the ability to change direction (agility), flexibility of the lower back and hamstring muscles, and endurance of students were significantly improved.

DISCUSSION

The results of this study indicated that after 1 year training with physical education program (curricular), standing height and weight of students had no significant changes. Cardiovascular endurance and physical fitness of student were much better significantly improved. The previous findings suggested that physical activity and exercise as a vehicle for improving health.[5,6] Participation of physical activity and exercise increases cardiovascular performance and respiratory fitness;[7,8] improves muscular strength, bone health.[9,10] Participation in regular physical activity promotes normal growth and development by helping youth build and maintain healthy bones, muscles, and joints. There are various factors, which are diminishing the interest of students in physical education activities. Although the physical education is being taught as a part of curriculum in all the schools, lack of adequate time and trained teachers, good facilities are responsible for little interest in this field.[11]

CONCLUSION

This study was to investigate the changes in physical fitness of students at Nghe An College of Economics. After 1 year of training physical education curriculum, physical fitness of students was remarkably improved; cardiovascular endurance was also significantly improved. There were no significant variations in height and weight. Current physical education curriculum was a beneficial vehicle to enhance physical fitness of students.

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Research Article

A comparative study of physical fitness of rural and urban students

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ABSTRACT

Physical fitness can be described as condition that helps us look feet and do our best physical fitness involves the performance of the heart and kings and the muscles of the body and since what we do with our bodies also affects what we can do with our minds, fitness influences to some degree qualities such as mental alertness and emotional stability. The purpose of the present study was to compare the physical fitness of rural and urban secondary school students of Ahmedabad district. In this study, 50 rural and 50 urban areas secondary school students were randomly selected for this study. Total 100 men students are subjects. AAHPERD youth fitness test was used as research tool. To measuring strength, abdominal strength, agility, leg strength, and speed endurance ability through the, respectively, test. Test was pull up, sits up, shuttle run, standing broad jump, 50 yard dash, and 600 yard run, or walk test was taken by researchers on subjects. Result indicates that the pull up, sits up, shuttle run, standing brood jump, 50 yards run, and 600 yard run or walk were found significant difference having "*t*" test.

Keywords: Physical fitness, Rural areas, Secondary school students, Urban areas

INTRODUCTION

Physically fitness is when you are using your body. Fitness is anything including being fit. Being physically fit means to have your body are working well. Fitness in the phrase "physical fitness" is being able to move, and deals with weights and stresses such as running, without damage and with reasonable stamina. It means having muscles in good condition and able to exert force when needed. It means being healthy, supple, and aware. The body adjusts very particularly toward the training stimuli it's needed to cope with. Your body will work best in the specific speed, kind of contraction, muscle-group usage, and power source usage it is familiar with in training. To be able to enhance your strength, endurance and fitness, you need to progressively boost the frequency, intensity, and duration of your workout routines. An east way to excite you're is to test different sports activities. Physical fitness is most easily under stood by examining. The four basic parts, cardiorespiratory endurance, muscular strength, muscular endurance, and flexibility cardiorespiratory. Endurance is the ability to deliver oxygen and nutrients to tissues and to remove wastes over sustained periods of time. Long runs and swims are among the methods employed in measuring this component muscular strength is the ability to a muscle to exert force for a brief body strength. As like, can be measured by various weightlifting exercise, pushups are often used to test endurance of arm and shoulder muscles and flexibility is the ability to move joints and use muscles through their full range of motion. The sit and reach are a measure of flexibility of the lower back and back of the upper legs exercise must become one of those things that are done without question such as bathing and brushing your teeth the researcher has tried to compare to the physical fitness of rural and urban areas secondary school students.

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Objectives of the Study

The purpose of the comparative study was to find out better physical fitness of rural and urban areas secondary school students.

Selection of the Subject

In the research work, only male secondary school students of the rural and urban areas of Ahmedabad district have been chosen as characters. The secondary school students from 50 of rural and 50 of urban areas, total 100 were randomly selected. Student of the 9th and 10th class, age group of 14–16 years was chosen.

Table 1: Significance of difference between the rural men and urban men group-wise physical fitness of AAHPERD youth fitness test

Variable	*n*	Student group		Mean difference	SD	"*t*" ratio
		Rural mean	Urban mean			
Pulls up (No)	50	6.36	4.84	1.52	0.24	6.22
Sits up (No)	50	27.24	19.66	7.58	0.98	7.73
Shuttle run (No)	50	11.63	12.34	0.71	0.49	1.45
Standing broad jump (m/c)	50	1.62	1.50	0.12	0.064	1.88
50 yard dash (s)	50	8.29	9.39	1.08	0.36	3.0
600 yard run or walk (min)	50	1.74	2.13	0.39	0.032	12.1

Significant at 0.05 level of confidence, "t" (1.96)

Procedure

On the selected subjects to measure of physical fitness of rural areas students and urban areas students. AAHPERD youth fitness test was conducted on both groups. To measuring strength, abdominal strength, agility, leg strength, speed, and endurance ability through the, respectively, test. The test of (1) pulls up, (2) sits up, (3) shuttle run, (4) standing broad jump, (5) 50 yard dash, and (6) 600 yard run or walk was taken.

Hypothesis

There would be significant difference in mean of all six test pulls up, sits up, shuttle run, standing broad jump, 50 yard dash, and 600 yard run or walk are between rural and urban areas secondary school students.

Statistical Technique

The data collected from the two groups through this research test were applied such statistical test as the mean test and the "*t*" test method and thereby they were analyzed statistically.

RESULTS

To determine the significance of physical fitness between the rural areas and urban areas secondary school (male) students group-wise compared. The comparative results are shown in Table 1.

DISCUSSION

Significant differences were found result of AAHPERD youth fitness test was indicating that, the physical fitness level of rural areas secondary school students was better than urban areas secondary school students. In AAHPER test – pulls up, sits up, 50 yard dash run, and 600 yard run or walk tests hypothesis were accepted. Rural areas secondary school students have more physical fitness compare urban areas secondary school students.

CONCUSSION

In physical fitness regular and scientifically designed and custom made fitness program supported by the old and culturally supported fitness program they altogether play a very important role. To remain fit throughout life there is a constant need of awareness of different parameters which support the overall well-being of health. To excel in sports, one must have high level of fitness and endurance because success in sports is ultimately the result of high degree of important role in emotion feelings of individual. Physical fitness and wellness for sports are also supported by good quality of nutrition with proper training. Overall fitness plays a very important role in all aspect of life.

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Research Article

The effect of twelve weeks strength training on the performance of basketball shot performance

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ABSTRACT

The effect of 12 weeks strength training on the performance of basketball set shot was the objective of this study. The study was conducted in Amhara regional state, Bahir Dar city youth basketball project of under-17 players. Twenty male voluntary basketball players were participated and completed the study protocol. The participants were divided into two groups (experimental $n = 10$ and control = 10). The experimental group participated in 20 min game and in weight lifting for 30 min (wrist curls, sitting press, biceps curl, and triceps extension). On the contrary, the control group players were playing only 20 min game. The pre-test was taken 3 days before the 12 weeks intervention began and post-test was taken 3 days after the intervention. Both groups tested for set shots from 4.6 m, 6.01 m, and 7.6 m far from the basket board at 45°, 90°, and 135° of angles. The entire data thus involve 30 shots in each distance or 10 shots at each angle totally 90 shot per individual participant. As per the ultimate of the study, inferential statistics as paired sample t-test and independent sample *t*-test were used to analyze the data. The descriptive part was done using mean, standard deviation, and mean difference. From the independent sample *t*-test, a statistically significant difference was observed between the experimental group and control group. Against the post-test result, the experimental group showed a better performance improvement in the tests which involve 4.6 m; 45°, 4.6 m; 90°, and 4.6 m; 135° than the control group, $P < 0.05$. The same way the experimental group showed a significantly better performance 6.01 m set shot (at an angle of 45° and 90°) and 7.6 m set shot (at an angle of 90° and 135°) as compared to the COG, $P < 0.05$. However, from 6.01 m distance far from the board, at 135° and from 7.6 m, 45°, there was no statistically significant different between the EXG and COG with $P > 0.05$ level. In general, the result indicates that, 12 weeks specific strength training has an effect to develop and improve basketball player's performance on set shot, at different distances and angles from the basket rim.

Keywords: Basketball, Performance, Set-shot, Strength training

INTRODUCTION

Basketball is a game of continuously changing tempo requiring players to be able to sustain high levels of continuous effort especially in scoring points, which when not made leads to wasted efforts. Manilovic and Erculj (2013) explained that basketball is characterized by m which explosive movement such as jumping, running, dunking, and rebounding to mention few. Athletic skills include physical traits such as strength, power, speed, quickness, coordination, agility, and endurance (Dominic *et al*., 2015).

Strength has been defined from several angles. Strength has been viewed as the capacity of the individual to exert muscular force the strength that a player have should be used in wise, to perform different sporting skills that leads to be successful in the game of sport. In the recent decade, the utilization of strength training interventions integrated with basketball training has been receiving notable attention among coaches. One of these interventions is the combination of strength and polymeric exercises in a single session. Andrejić (2012) found out that such strategy demonstrated enhancement in motor performance among youth basketball players. Strength is not only to apply force but also the ability to maximize that force for a well performed physical task like shooting the basketball.

Both strength and power training has been consistently shown to improve speed, acceleration and jumping ability (Harris, 2011). However, its contribution to shooting ability has not been well defined. Although muscular power and endurance are also essential components of the game, from the practical point of view strength testing is used most commonly to assess

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muscular fitness of basketball players (Eriulj *et al*., 2015) not for shooting ability.

Shooting has been known to be that one important part of the basketball game, therefore, is a scoring team always winning the game. This makes the skill very significant and requires that the successful athlete, male or female, to be one who has been training based on scientifically based training management strategy tailored to fit his or her style of shooting for best performance. Oshea, (2000), referred to this type of training as athletic type strength training. "How hard your plan works today determines how well you perform tomorrow." Several research studies have determined whether shooting percentages are affected by practice shooting with backboards raised above official height, shooting with oversized balls, and shooting at baskets smaller than regulation size.

Other studies examined the effect of weight training on performance of elite basketball players; the effect of muscular endurance, as improved by weight training, and the relationship of strength and fatigue to shooting free throws in basketball. However, no previous study has determined the effects of strength improvement on basketball shooting performance at various distances and angles from the basket on beginner basketball players. Hence, this study was carried out to identify the strength demand of the basket shots at different distance.

METHODS

Participants

(n = 20 male) subjects, enrolled in basketball project training at Amhara Regional state, Bahir Dar city basketball project were divided into two groups. The homogeneity of the group is correct since all the players are joined at the same year 2010 while the project was open, and players randomly assigned in the group.

The groups were formed as follows: Experimental group (n = 10): This group participated in a basketball game for 20 min and lifted weights for 30 min each session. The exercises used as an intervention was the wrist curls and sitting press, biceps curl, and triceps extension. The subjects did three sets of sitting presses, 8–12 repetitions.

Control group (n = 10): The subjects in this group played a basketball game for 20 min and then practiced set shots for 30 min from all positions on the basketball floor. Subjects followed their respective programs for 12 weeks, 3 times per a week (Saturday, Sunday, and Thursday). All subjects were given a shooting test at the beginning and end of a 12-weeks period.

Ten set shots were taken at each of three distances and angles from the basket. The distances were 4.6 m, 6.01 m, and 7.6 m and the angles were 45, 90, and 135°. A total of 90 shots were taken, ten at each angle, which is 30 at each of the three distances. The groups were considered as representative of the same population since the analysis of variance between groups on initial scores at all distances resulted in an insignificant F ratio of .69. The reliability of the test was found to be 0.68 and was determined by the test re-test procedure.

The Effect of Strength Training on the Performance of Basketball Shot on Beginner Player [Table 1].

Measures

Pre and post measures were gathered 3 days prior and after the interventions in EXG and COG. These include set shots at 4.6 m, 6.01 m, and 7.6 m with different angles (45°, 90°, and 135°), measure and all training session were taken inside the facility of Bahir Dar University. On the other hand, fundamental skill tests in basketball were administered at the open basketball grounds of the university.

RESULTS

Independent sample t-test (at 4.6 m, at 45°, 90°, and 135°) basketball shoot [Table 2].

There was statistically a significance difference between experimental group and control group at 4.6 m, at 45 angle of set shot, with t (18) = 5.940, $P > 0.05$ level (EXG, score M = 6.6000, STDV = 1.07497, and COG, score M = 3.8000, SDV = 1.03380), with their MD = 2.80000.

At the same distance, 90° of angle, there was a significance difference on experimental group than control group with, t (18) = 2.852, $P < 0.05$ level (EXG, score M = 6.9000. SDV = 1.37032 and COG, score M = 5.2000, SDV = 1.31656) with their MD = 1.70000.

On the other hand, at 135°, the EXG show a higher statistical difference than the COG, t (18) = 2.852, $P < 0.05$ level, (EXG, score M = 6.0000, SDV = 1.82574 and COG, score M = 4.0000, SDV = 1.63299) with their MD = 2.0000.

Independent Sample t-test (6.01 m at 45°, 90°, and 135°) Basketball Shoot [Table 3]

A significance difference seen on the experimental group at 6.01 m, 45° of angle with t (18) = 3.000, $P < 0.05$ level. (EXG, score M = 1.5000, SDV = 1.24722 and COG score M = 3.5000, SDV = 0.97183) with their mean difference (MD = 1.50000). At 90°, set shot the EXG, shows a significance difference than the COG, with t (18) = 2.75, $P < 0.05$ level, EXG score M = 7.0000, SDV = 1.63299) COG, score (M = 5.400, SDV = 0.84327), with their MD = 1.60000. At the same feet 135° of angle shot was no significance difference between the excremental and control group with t (18) = 1.443, $P > 0.05$ level.

Independent Sample *t*-test (7.6 m at45°, 90°, and 135°) Basketball Shoot

At 7.6 m shot, 45° set shot test, there was no significance difference between EXG and COG with statistical value, t (18)= 1.549, $P > 0.05$ level, MD = 1.2000 at $P = 1.39$ [Table 4].

Shooting score at 90°, 7.6 m, a significance difference was seen between the EXG and COG at t (18)= 3.157, $P < 0.05$ level, (EXG score, M = 5.0000. SDV = 1.3333 and COG score, M = 3.3000, SDV = 1.05935) with their MD = 1.70000. At 135°, 7.6 m, statistically a significance difference was shown between the experimental group and control group on shooting basketball with (EXG score, M = 5.9000, SDV = 1.37032, and COG, M = 2.8000, SDV = 1.03280) their MD = 3.10000. This difference was also statistically express with, t (18) = 5.713, $P < 0.05$ level.

Experimental Group 4.6 m, 45, 90, and 135°, Paired Sample Test [Tables 5 and 6]

At 4.6 m, 45°

The experimental group shows higher significant change with t (9)= −7.606, $P < 0.05$ when the post-test result compared with the pre-test, but the control group did not t (9) = −0.361, $P < 0.05$ level. Hence, we can conclude that specific strength training has a good mechanism to increase basketball set shots at a short range. (15 feet far from the board with 45°, which is a place, most basketball player take higher percentage of shoots).

At 4.6 m, 90°

The experimental group was shown a significance improvement after the intervention, t (9) = −3.539, $P < 0.05$ level as compared with the pre-test, when we see the control group, t (9) = 0.391,

Table 1: 12 weeks strength training program

Week	Exercise	Set and repetitions
Week-1 and Week-2	Wrist curls and sitting press, Biceps Curl, Triceps Extension.	2 Sets 8 repetition 1 and ½ min rest in between
Week-3 and Week-4	Wrist curls and sitting press, Biceps Curl, Triceps Extension.	2 Sets 10 repetition 1 and ½ min rest in between
Week-5 and Week-6	Wrist curls and sitting press, Biceps Curl, Triceps Extension.	2 Sets of 10 repetition 1 min. rest in between
Week-7 and Week-8	Wrist curls and sitting press, Biceps Curl, Triceps Extension.	3 Sets 8 repetition 1 min rest in between
Week-9 and Week-10	Wrist curls and sitting press, Biceps Curl, Triceps Extension.	3 Sets of 10 repetition 1 min rest in between
Week-11 and Week-12	Wrist curls and sitting press, Biceps Curl, Triceps Extension.	3 Sets of 12 repetition 1 min rest in between

10 min warming up was used before each training session

Table 2: Shots from 4.6 m

t-test for equality of mean				95% confidence interval difference				
Degree	*n*	t	Df	Sig. (two-tailed)	Mean difference	Standard error difference	Lower	Upper
45°	20	5.94	18	0.000**	2.80000	0.47140	1.80962	3.7903
90°	20	2.82	18	0.001*	1.70000	0.60093	0.43750	2.96250
135°	20	2.582	18	0.019*	2.00000	0.77460	0.37260	2.96264

**Significant at $P<0.01$ level, *Significant at $P<0.05$ level

Table 3: Shot from 6.01 m

t-test for equality of mean			95% confidence interval difference				
	t	df	Sig. (two-tailed)	Mean difference	Standard error difference	Lower	Upper
450	3.000	18	0.008*	1.5000	0.50000	0.44954	2.55046
90°	2.753	18	0.013*	1.6000	0.58119	0.37897	2.82737
135°	1.443	18	0.166	1.0000	0.69282	0.56862	2.83138

**Significant at $P<0.001$ level. *Significant at $P<0.05$ level

Table 4: Shot from 7.6 m

t-test for equality of mean			95% confidence interval difference				
	t	df	Sig. (two-tailed)	Mean difference	Standard error difference	Lower	Upper
45°	1.549	18	0.139	1.20000	0.77460	−0.42737	2.82737
90°	3.157	18	0.005*	1.70000	0.53852	0.56862	2.83138
135°	5.713	18	0.000**	3.10000	0.54263	1.95375	4.24002

**Significant at $P<0.001$ level. *Significant at $P<0.05$ level

$P > 0.05$ which indicates that the experimental group was a higher statistical significance improvement they was shown than the control group.

At 4.6 m, 135°

The experimental group was shown t (9) = −2.666, $P < 0.05$ level and the control group t (9) = 0.612, $P > 0.05$ level.

Experimental Group 6.01 m, 45, 90, and 135° [Table 7]

Control Group 6.01 m, at 45, 90, and 135° Paired Difference [Table 8]

At 6.01 m 45°

Statistical a significant improvement was seen on the EXG compare with the control group, EXG, t (9) = −5.667, $P < 0.05$ level but the control group score, t (9) = 0.000, $P < 0.05$ level. This means that the experimental group was much better on the improvement of set shot at this distance and poison than the control group.

At 6.01 m, 90°

As the result indicates that statistically a significance improvement was seen with experimental group compared with the control group, (EXG, t (9) = −5.014, $P < 0.05$ level and COG, t (9) = −0.408, $P > 0.05$ level).

At 6.01 m, 135°

The experimental group was show statistically a higher improvement at this distance and of position during the post-test as compared with the pre-test result with t (9) = −5.659, $P < 0.05$ level but the control group was not t (9) = −0.709, $P > 0.05$ level.

At 7.6 m, 45°

Statistically, a significance difference was shown at post-test result on the experimental group compared with the pre-test result, with t (9) = −6.000, $P < 0.05$ level, but the control group was not t (9) = −1.000, $P > 0.05$ level [Tables 9 and 10].

Table 5: Paired difference

	t	Df	Sig.
4.6 m, 45° pre and post	−7.606	9	0.000**
4.6 m, 90° pre and post	−3.539	9	0.006*
4.6 m, 135° pre and post	−2.666	9	0.026*

**Significant at $P<0.01$ level. *Significant at $P<0.05$ level

At 7.6m, 90°

The experimental group shows statistically a significance difference between the pre-test and post-test with t (9) = 0.287, $P < 0.05$ but, the control group was not shown any statistical difference with their pre-test as compare with the post-test result, t (90) = 0.287, $P > 0.05$ level.

At 7.6 m, 135°

The experimental group was show a significance difference on set shot at 7.6 m, 135° of position on the post-test result compared with the pre-test result with the value of t (9) = −7.619, $P < 0.05$ level, but the control group was not t (9) = 0.198, $P > 0.05$ level.

DISCUSSION

This study was aimed at examining the effect of strength training on basketball shooting performance, subjects were randomly assigned as experimental (n = 10) and control group (n = 10), randomly after the pre-test was taken. The experimental group was participated in 20 min basketball game and weight training; the control group was only participating in 20 min basketball game.

After 12 weeks, intervention players were tested from three points of distances, and three points of angles, most of the result shows that there was statistically a significant difference observed on experimental group with a better shooting performance after the strength training was taken than the control group at 4.6 m, 45, 90, and 135° with $P < 0.05$ level. Comparative Effect of Specific Weight Training on the Performance of Lay-Up and Jump Shot was studied by (SuhelRaza,) the result of the study revealed that both the training groups leg strength and arm strength training group/improved lay-up shot performance of basketball, (F ratio = 13.469). On the other hand, at 6.01 m, 45 and 90° with $P < 0.05$ level, a significance difference was observed on the experimental group than the control group. However, at 6.01 m, 135° there was no significance difference between the experimental and control group on basketball set shoot skill. This might be because the of the angle to shot and score a basket has only one chance, which means a player cannot use the basket board in adjacent this position of shot compared with other angles of shoot positions. The location of the shot on the basketball court with respect to the basket substantially influences shot type selection, (Chialvo, 2015). Again no

Table 6: Control group 4.6 m, 45, 90, and 135°

Mean		SD	95% CI lower upper		*t*	df.	Sig.
COG, 4.6 m, 45° pre and post	−0.10000	0.87560	−0.72636	0.52636	−0.361	9	−0.726
COG, 4.6m, 90−0 pre and post	0.20000	1.61933	−0.95840	1.35840	0.391	9	0.705
COG 4.6 m, 135° Pre and post	0.20000	1.03280	−0.53882	0.93882	0.612	9	0.555

** Significant at $P<0.01$ level, *$P<0.05$ level

Table 7: Set shot

	T	Df	Sig
6.01 m, 45° pre and post	−5.667	18	0.000**
6.01 m, 90° pre and post	−5.014	18	0.001**
6.01 m, 135° pre and post	−5.659	18	0.000**

**Significant at *P*<0.01 level, **P*<0.05 level

Table 8: Shot from 6.01 m

	T	df	Sig
6.01 m, 45° pre and post	0.000	9	1.000
6.01 m, 90° pre and post	−0.408	9	0.693
6.01 m, 135° pre and post	−0.709	9	0.496

***P*<0.01 level, **P*<0.05 level

Table 9: Experimental at 7.6 m, 450, 900, and 1350: Set shot score

	t	df	Sig.
7.6 m, 45° pre and post	−6.000	9	0.000**
7.6 m, 90° pre and post	−6.273	9	0.000**
7.6 m, 135° pre and post	−7.619	9	0.000**

***P*<0.01 level, *P*<0.05 level

Table 10: Control group at 7.6 m, 45, 90, and 135°

	t	Df	Sig
7.6 m, 45° pre and post	−1.000	9	0.343
7.6 m, 90° pre and post	0.287	9	0.780
7.6 m, 135° pre and post	0.198	9	0.847

***P*<0.01 level, **P*<0.05 level

significant difference was seen between the experimental and control group at 25 feet, 45°, $P > 0.05$ level this might be because all parts of the body needed strength training to shoot a basket from long distance and score accurately. With this, Dnte and Chialvo, 2015, shows that youth competitions, which is what we would expect, given that the average distance is much lower in youth competitions, youth basketball shot is much closer to the basket. In the observed youth games, more shots are executed jumping or standing on one leg, shots near the basket are more successful. Again as (Titmuss, 1989) shows on his study that significant relationship was only found between abdominal strength and free throw shot performance ($r = 0.057$; $P < 0.05$). The free throw shot is a closed skill, in which a natural action is established, as the ball is released into the ring, the knee is straightened up with mainly the abdominal muscles contributing significantly to the power for the shot (Titmuss, 1989).

Basketball players, set shot performance at, 7.6 m, 90°, and 135°, the experimental group was improved with higher statistical difference than the control group with $P < 0.05$ level. In general 12 week's specific strength training which was used as an intervention for experimental group has shown a great significant influence, on the improvement of basketball players set shot performance compared with the control group which was not exercise strength training. Some researchers also support this idea like, Hoy and Carter (1988) explained that though the power for the jump shot is provided by the legs, the actions of the arms, wrist, hands, and the fingers provides the height, accuracy, and direction to the ball. Therefore, there is a particular level of strength training of the arm, harmonized with the skill practice that will ensure a high level of jump shot ability. Since in basketball shooting, the overall performance objective is maximum accuracy of projection (Miller, 1998, Laurine and Robert, 2001). Reversely, Dominic *et al*., 2015, explained that a significant relationship was observed between abdominal strength and free throw ($r = 0.05, 0.517$), and there was no significant relationship between arm strength and free throw shoot ($r = 0.05 > -0.19$). This indicates that if other parts of the body such as abdominal and lower extremities have get strength training a better shot performance could be expected with different types of shoots too.

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Research Article

Effects of selected physical exercises on promoting physical fitness of preschoolers

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ABSTRACT

The aim of this study was to determine the effects of selected physical exercises on promoting physical fitness of preschoolers. Participants were preschoolers aged 3–4 years in two kindergartens of Hanoi city, Vietnam. They were divided into experiment group (EG) and control group (CG). The number of participants in each group is 54. Each group has 30 males and 24 females in both groups. After 12 weeks of selected exercise program, subjects in EG showed better performances in physical tests in comparison to CG. It could be concluded that selected physical exercises is beneficial for promoting physical fitness of preschoolers.

Keywords: Physical exercise, Physical fitness, Preschoolers

INTRODUCTION

The preschool years are characterized by significant changes in the acquisition and performance of children's locomotor and objects control skills. Components of physical fitness includes strength, cardio respiratory endurance, speed, balance, and flexibility.[1] Regular participation in the physical activity has been clearly established as being integral to health and well-being in school-aged children. The physical activity also promotes healthy lifestyle habits that lead to healthy and active lives. By laying a strong foundation, children will remain physically active as they get older because physical activity will be an important part of their lives. This will keep them healthy and prevent certain diseases as they age.

Recent study concluded that children attending preschools spend most of the day in sedentary behavior. Activities initiated by adults tend to result in the lower levels of the physical activity among children. The space inside for games, outdoor games, markings on the floor to play, jumping, and climbing equipment are some actions that increase the level of daily physical activity of children in such places.[2]

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The aim of this study was to determine the effects of selected physical exercises on promoting physical fitness of preschoolers.

METHODS AND DESIGN

Participants are preschoolers aged 3–4 years in two kindergartens of Hanoi city, Vietnam. They were divided into experiment group and control group. The number of participants in each group is 54. Each group has 30 males and 24 females in both groups. Before the recruitment, parents were asked to report their child's health history, and signed the consent of participation in this study. Exclusion criteria: Participants have chronic pediatric diseases or orthopedic condition that would limit to perform exercises. Subjects in EG were instructed to follow selected exercise program in 12 weeks, 3 times a week out of class time, and at the beginning of class time. Participants in CG were asked not to participate in any new physical program but still followed normal physical lesson assigned by school in class time.

Statistical Analysis

Paired sample test and ANOVA were performed to analyze the differences of pre-test and post-test within and between groups. $P < 0.05$ was considered to be statistical significant.

Selected Physical Exercises

These following physical exercises have been chosen by teachers, trainers, and experts who are working in the field of physical education and sports.

Physical exercises	Purposes
Walking while carrying objects (pulling or pushing objects)	Improving body control and rhythmic movement
Waking over low obstacles	Improving lower strength and balance
Walking with 2 hands up	Developing strength of trunk, balance, and rhythmic movement
Long walking	Improving stamina or endurance
Running in the circle, running on the narrow lane	Improving balance and rhythm
Running in the direction of the signal or running in the prescribed line	Improving flexibility, balance, and rhythm
Interchangeable 100 m-slow running or walking	Improving cardiopulmonary function
Sprint in short distance	Improving speed and flexibility
Four-direction running	Improving speed, flexibility, reaction, and endurance
Gathering feet for jumping forward repeatedly	Improving lower strength
Gathering feet for jumping with head reach the hanging object	Improving lower strength, rhythm
Gathering feet to jump over small ditch (drawing lines or using symbolic cords)	Improving lower strength, endurance, balance, and rhythm
Long jump standing	Improving lower explosive strength
Stall climbing	Improving upper strength, lower strength limbs, and movement coordination
Slide climbing	Improving upper strength, lower strength limbs, and movement coordination
Backward crawl	Improving flexible, rhythmic movements

Outcomes Measurements

Outcomes measurements were determined by the five following tests: Running 10 m (s), standing long jump (cm), sit and reach (±cm),[3] throwing with 2 hands (m), and tossing the ball into the bucket with 2 hands (times).[4]

RESULTS AND DISCUSSION

Results of Key Morphological Parameters of Subjects

The results of Table 1 indicated that there were no significant differences in height and weight for both boys and girls between experiment and control groups after 12 weeks of intervention with $P > 0.05$.

Results of Table 2 showed that there were no statistically significant differences in all tests of physical fitness for both sexes between experiment and control groups before intervention with $P > 0.05$.

Results presented in Table 3 showed that there were no statistically significant differences for both boys and girls between pre-test and post-test of control group with $P > 0.05$.

Results in Table 4 showed that there were statistically highly significant differences for both boys and girls between pre-test and post-test of experiment group with $P < 0.01$.

Results of Table 5 showed that there were statistically significant differences in all test parameters of physical fitness for both sexes between experiment and control groups after intervention with $P < 0.01$. In this study, the effects of selected physical exercises program on strength, speed, flexibility, rhymth, balance, and endurance in 3–4 years old preschoolers were investigated. As a result of 12-week selected physical exercises training, it was determined that there were statistically significant differences between pre-test and post-test of experiment group with $P < 0.05$. When the measurement differences between the two groups, there were significant differences in all physical test with $P < 0.05$. A study proved that physical activity is fundamental to the early development of each child and affects many aspects of a child's health.[5] Another finding concluded that outdoor learning activities contribute to cognitive, linguistic, motor, and social emotional development of preschool children.[6] Children in preschool age should be encouraged to practice fun activities, games, exploring various physical and emotional experiences, and environments, such as play and activities, including several actions, including run, swim, jump, play, think, draw up plans, in insurance, and supervised environments.[7] It also suggested that physical activity, at early ages, being associated with positive effects on health, even in age from 2 to 6 years. A review with children found the positive relationship between increased physical activity with favorable measures of adiposity, bone density, and factors cardiometabolic.[8] Results of this study is, to some extent, consistent with the finding which proved that physical exercises had positive effects on speed, leg strength and VO2 of children.[9]

Table 1: Morphological parameters of subjects

Sex	Height					Weight				
	CG		EG		*P* value	CG		EG		*P* value
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Boys n=30	97.18	1.89	97.74	1.83	>0.05	15.64	0.87	16.23	1.00	>0.05
Girls n=24	96.33	2.14	96.77	1.87	>0.05	15.76	1.15	15.83	1.17	>0.05

Table 2: Comparison of physical fitness between CG and EG before intervention

Sex	Tests	CG		EG		*t*	*P* value
		Mean	SD	Mean	SD		
		n=30		*n*=30			
Boys	Running 10 m (s)	4.09	0.40	4.15	0.38	0.63	>0.05
	Standing long jump (cm)	71.70	8.31	71.76	8.29	0.02	>0.05
	Throwing with 2 hands (m)	2.63	0.16	2.66	0.14	0.27	>0.05
	Tossing the ball into the bucket with 2 hands (times)	1.87	0.77	1.80	0.80	0.32	>0.05
	Sit and reach (±cm)	1.21	0.62	1.31	0.59	0.11	>0.05
	Tests	***n*=24**		***n*=24**			
Girls	Running 10 m (s)	4.41	0.15	4.43	0.16	0.15	>0.05
	Long jump standing (cm)	71.15	3.44	71.73	3.45	0.27	>0.05
	Throwing with 2 hands (m)	2.51	0.12	2.54	0.11	0.74	>0.05
	Tossing the ball into the bucket with 2 hands (times)	2.17	0.38	2.17	0.48	1.73	>0.05
	Sit and reach (±cm)	1.62	0.43	1.80	0.60	1.62	>0.05

Table 3: Pre- and post-comparison of physical fitness of CG

Sex	Tests	Pre-test		Post-test		*t*	*P* value
		Mean	SD	Mean	SD		
Boys=30	Running 10 m (s)	4.09	0.40	3.99	0.36	1.61	>0.05
	Standing long jump (cm)	71.70	8.31	72.23	8.07	1.30	>0.05
	Throwing with 2 hands (m)	2.63	0.16	2.71	0.11	0.05	>0.05
	Tossing the ball into the bucket with 2 hands (times)	1.87	0.77	1.97	0.71	1.79	>0.05
	Sit and reach (±cm)	1.21	0.62	2.28	0.65	1.57	>0.05
Girls *n*=24	Running 10 m (s)	4.41	0.15	4.38	0.23	1.00	>0.05
	Long jump standing (cm)	71.15	3.44	73.37	4.67	2.52	<0.05
	Throwing with 2 hands (m)	2.51	0.12	2.58	0.11	0.49	>0.05
	Tossing the ball into the bucket with 2 hands (times)	2.17	0.38	2.25	0.44	0.81	>0.05
	Sit and reach (±cm)	1.62	0.43	1.67	0.46	0.75	>0.05

Table 4: Pre- and post-comparison of physical fitness of EG

Sex	Tests	Pre-test		Post-test		*t*	*P* value
		Mean	SD	Mean	SD		
Boys *n*=30	Running 10 m (s)	4.15	0.38	3.58	0.35	9.15	<0.01
	Standing long jump (cm)	71.76	8.29	93.70	6.77	12.14	<0.01
	Throwing with 2 hands (m)	2.66	0.14	3.21	0.25	9.61	<0.01
	Tossing the ball into the bucket with 2 hands (times)	1.80	0.80	2.53	0.77	5.80	<0.01
	Sit and reach (±cm)	1.31	0.59	4.58	0.69	22.64	<0.01
Girls *n*=24	Running 10 m (s)	4.43	0.16	3.74	0.29	11.37	<0.01
	Long jump standing (cm)	71.73	3.45	92.46	5.19	14.05	<0.01
	Throwing with 2 hands (m)	2.54	0.11	3.39	0.20	17.96	<0.01
	Tossing the ball into the bucket with 2 hands (times)	2.17	0.48	3.04	0.99	4.32	<0.01
	Sit and reach (±cm)	1.80	0.60	4.58	0.31	21.14	<0.01

Table 5: Comparison of physical fitness between CG and EG after intervention

Sex	Tests	CG		EG		*t*	*P* value
		Mean	SD	Mean	SD		
		n=30		*n*=30			
Boys	Running 10 m (s)	3.99	0.36	3.58	0.35	3.58	<0.01
	Standing long jump (cm)	72.23	8.07	93.70	6.77	12.67	<0.01
	Throwing with 2 hands (m)	2.71	0.11	3.21	0.25	4.39	<0.01
	Tossing the ball into the bucket with 2 hands (times)	1.97	0.71	2.53	0.77	23.58	<0.01
	Sit and reach (±cm)	2.28	0.65	4.58	0.69	19.53	<0.01
	Tests	***n*=24**		***n*=24**			
Girls	Running 10 m (s)	4.38	0.23	3.74	0.29	6.11	<0.01
	Long jump standing (cm)	73.37	4.67	92.46	5.19	17.41	<0.01
	Throwing with 2 hands (m)	2.58	0.11	3.39	0.20	6.41	<0.01
	Tossing the ball into the bucket with 2 hands (times)	2.25	0.44	3.04	0.99	24.62	<0.01
	Sit and reach (±cm)	1.67	0.46	4.58	0.31	42.26	<0.01

CONCLUSION

In this study, physical fitness of preschoolers was considered. Selected physical exercises were used to assess the some motor skills of preschoolers. After 12-week intervention, subjects of experiment group showed better performances in all parameters of physical tests. It could be concluded that selected physical exercises is beneficial for promoting physical fitness of preschoolers.

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Research Article

Impact of perceived motivational dance climate to intercultural competence among cultural troupe dancers

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ABSTRACT

As a form of formal education and through cultural education in school curriculum, dance may have a pedagogical approach to developing intercultural competence. Therefore, the purpose of this study was to determine the relationship between the perceived motivational dance climate in terms of task- and ego-involving climate and intercultural competence in terms of attitudes, knowledge, and skills among selected cultural dance troupe members in Mindanao State University System. Age, sex, ethnicity, membership, duration of rehearsal, frequency of rehearsal, number of ethnic dances learned, and dance experience as moderating variables were taken into consideration. A total of 76 troupe members were taken as respondents utilizing the total enumeration sampling procedure. The Perceived Motivational Climate in Sport Questionnaire 2 adapted for dance by Quested and Duda (2009) and the self-constructed questionnaire entitled Intercultural Competence in Ethnic Dance Questionnaire pilot tested for validity comprised the principal tool in gathering the data needed in the study. A small group discussion was also employed. Frequency and percentage distributions were used to describe the data. Pearson r and one-way ANOVA for the correlation portion, and the coefficient of determination (r2) measured the predictive accuracy for r. Results on the correlation between moderating and independent variables indicated that all of the relationships were not significant except for correlations: Ethnicity to task-involving climate; duration of rehearsal to task-involving climate; frequency of rehearsal to task-involving climate; duration of rehearsal to ego-involving climate; and frequency of rehearsal to ego-involving climate. The correlation between the moderating and dependent variables declared no significant relationships. All of the relationships existing between the independent variable of ego-involving climate and the dependent variable of intercultural competence: Attitudes, knowledge, and skills showed no significant relationship. While all of the relationships between the independent variable of task-involving climate and the dependent variable of intercultural competence: Intercultural attitudes, intercultural knowledge, and intercultural skills were viewed significantly.

Keywords: Intercultural attitudes, Intercultural competence, Knowledge and skills, Perceived motivational dance climate, Task- and ego-involving climate

INTRODUCTION

Dancers are essential contributors to peaceful coexistence. Through the language of dance and their bodies as instruments of communication in understanding themselves and others in the context of diversity, they can lead to the transformation of any culturally diverse region into a harmonious society. Learning the dances of other people carries with it benefits for intercultural understanding. Mutual understanding and intercultural competence are more vital than ever today because it can address some of the most virulent problems of the present societies such as stereotyping, prejudice, discrimination, and all forms of racism, all of which linked to socioeconomic, political inequalities, and misunderstandings between people from different cultural backgrounds and affiliations.

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Cultural affiliations influence not only how people perceive themselves and their own identities but also how they perceive others, other groups and other ways of acting, thinking and feeling, and how they perceive the relationships between groups (Huber and Reynolds, 2014). Panopio *et al*. (1984) pointed out that there are important ethnic group relations in the Philippines identified as "Cultural Communities" that represent different degrees of cultural development and have retained their indigenous way of life and maintained their culture in their clothes, art, religion and other superficial differences. They

include the *Moros* or the Filipino Muslims and other *Lumads* "ethnolinguistic groups" found in the mountain regions of Northern Luzon and other marginal areas of Luzon, Visayas, and Mindanao.

There is a felt urgency to help these people to live together in a culturally diverse society, especially in the country at present. As current events continue to show, there is an exigent need for a concerted effort to develop the necessary attitudes, knowledge, and skills that contribute to intercultural competence in the everyday practice of any learning contexts so that future generations may be equipped to participate in an increasingly complex environment. Thus, individuals need to acquire intercultural competence. For this reason, intercultural education can make an essential contribution to peaceful coexistence. It has also been found that intercultural competence can be enhanced through intercultural education and training. As pedagogy, it can develop intercultural competence in different ways through different types of education (Huber and Reynolds, 2014).

Purpose of the Study

The context of the present study explored on the correlation between the perceived motivational dance climate in terms of task- and ego-involving climates as an independent variable and the degree of development of intercultural competence in terms of intercultural attitudes, knowledge, and skills as a dependent variable. In addition, this study also determined whether the selected variables such as age, sex, ethnicity, membership, duration of rehearsal, frequency of rehearsal, number of ethnic dances learned, and dance experience as moderating variables affect the main relationship.

METHODOLOGY

Study Design

This study is a descriptive-correlational type utilizing both qualitative and quantitative methods in determining the significant relationships between the perceived motivational dance climate in terms of task- and ego-involving climate as an independent variable and intercultural competence in terms of attitudes, knowledge, and skills as a dependent variable. Age, sex, ethnicity, membership, duration of rehearsal, frequency of rehearsal, number of ethnic dances learned, and dance experience are the moderating variables believed to affect the relationship of the main variables of the study.

The descriptive method described the respondents' demographic profile that includes the moderating variables and also the main variables. The correlational method determined the relationship between variables, and the contribution of one parameter to another was determined by the determination method. To substantiate the answers of the respondents on the survey questionnaire, a small group discussion was employed for these qualitative data.

Respondents

The study was conducted in the two selected campuses of the Mindanao State University System (MSUS); the (1) MSU-Main in Marawi City and (2) MSU-Iligan Institute of Technology (IIT) in Iligan City. These two cultural dance troupes were chosen among the established dance troupes in the MSUS because they are considered the purest cultural dance troupes specializing only ethnic dances in their dance repertoires, among others. A total enumeration procedure was utilized in the study. A total of 76 members of the selected cultural dance troupe officially enrolled during the 1st Semester, AY 2017–2018, were taken as respondents such as the Darangan Cultural Dance Troupe of MSU-Marawi (26 members) and the Kalimulan Cultural Dance Troupe of MSU-IIT (50 members).

Instrumentation

A research questionnaire was the principal instrument used in gathering the desired data that is comprised of three parts. The first part is the respondents' demographic profile to obtain the data such as age, sex, ethnicity, membership, duration of rehearsal, frequency of rehearsal, number of ethnic dances learned, and dance experience. To measure the respondents' perceptions of the prevailing motivational dance climate on their respective troupes, the adapted version of the 33-item Perceived Motivational Climate in Sport Questionnaire 2 (PMCSQ-2) adapted for dance by Quested and Duda (2009) was utilized as part II. The PMCSQ-2 was originally designed for use in competitive sport contexts; hence, the phrasing or examples used in the items may not be representative of reality in dance. Thus, it was re-worded wherein the underlying themes of task- and ego-involving motivational climates captured in the subscales of the PMCSQ-2 and to be more relevant and meaningful in the dance contexts. The items were hierarchically ordered into two first-order scales: Task-involving (mastery-oriented) and ego-involving (performance-oriented) climates which have been evaluated with a 5-point Likert scale (1 = strongly disagree–5 = strongly agree) the extent to which that particular statement characterized their troupe's motivational climate as to "very low," "low," "average," "high," and "very high" level in terms of the task- and ego-involving climates perception. Cronbach's alphas were calculated for the internal consistency of the two higher-order scales: "Task-involving climate" ($a = 0.88$) and "ego-involving climate" ($a = 0.87$). Finally, a self-constructed questionnaire on Intercultural Competence in Ethnic Dance Questionnaire (ICCEDQ) pilot tested for validity was utilized to assess on the degree of development of intercultural competence: attitudes, knowledge, and skills among the respondents as part III. Reliability was established at $a = 0.890$ for the 16 items. The statements that comprised the questionnaire were developed based on literature reviews and with the help of experts. It is measured on a 5-point Likert scale (1 = strongly disagree–5 = strongly agree) indicating the degree of development as to "very low," "low," "average," "high," and "very high"

competency in terms of intercultural competence after learning and performing ethnic dances. In addition, a 9-Item Interview Guide based on the ICCEDQ was utilized for the small group discussion.

Procedure

Before the gathering of the primary data, the ICCEDQ was pilot tested for validity. A total of 16 respondents based on definite criteria suggested by the researcher's peers and statisticians were utilized. Upon passing the reliability requirement, letter-requests were sent to the Director of the Cultural Affairs/ Development Office thru the Artistic Director of the respective dance troupes, and to the respondents. Separate sessions were requested for the conduct of the small group discussion utilizing 10 participants based on certain characteristics. Then, facilitated discussions and answers were transcribed.

Data Analysis

All of the descriptive portions of the study were described through frequency and percentage distributions. For the correlation determining the significant relationships between variables, Pearson r was used for ordinal variables, and one-way ANOVA was employed for the nominal variable. To give more precise meaning and interpretation of the findings, the coefficient of determination (r^2) measured the predictive accuracy for r in which predictive accuracy is the percentage contribution of one variable when correlated to another.

RESULTS

As revealed in Table 1, mostly of 44.7% (34 respondents) were in the age range of 20–22 years old. In terms of sex, the majority or 47 respondents (61.8%) were female. A high percentage of the respondents (34 out of 76) or 44.7% were Cebuano followed by the Meranaw with 16 respondents or 21.1%. Half of the respondents or 50.0% (38 respondents) were members of their respective dance troupes for <1–<3 years.

Results in Table 2 revealed that the majority of 44 respondents or 57.9% spent 4–5 h of rehearsal per session in terms of duration of the rehearsal. Furthermore, the majority of 65.8% (50 respondents) were in the range of 0–1 session per week in terms of frequency of rehearsal. A high percentage of 76 respondents or 46.1% had learned a range of 1–8 ethnic dances closely followed by 34 respondents or 44.7% with 9–16 dances. While in terms of dance experience, most of the respondents of 34.2% (26 respondents) were in the ranges of both <1–<4 years and 4–<8 years.

Table 3 revealed that in terms of perceived task-involving climate, a very high percentage of 71 respondents or 93.4% scored "very high." On the other hand, a high percentage or 28.9% (22 respondents) scored "very low" in terms of perceived ego-involving climate.

Table 1: Age, sex, ethnicity, and membership of the respondents

Respondents age/sex/ ethnicity/membership	Number of respondents (*n*=76)	Percentage
Age (years)		
29–31	3	3.9
26–28	4	5.3
23–25	9	11.8
20–22	34	44.7
17–19	26	34.2
Sex		
Male	29	38.2
Female	47	61.8
Ethnicity		
Cebuano	34	44.7
Meranaw	16	21.1
Bisaya	10	13.2
Kamayo	5	6.6
Ilongo	4	5.3
Boholano	2	2.6
Subanon	2	2.6
Bukidnon	1	1.3
Maguindanao	1	1.3
Melayo	1	1.3
Membership (years)		
>12	1	1.3
9–<12	2	2.6
6–<9	4	5.3
3–<6	31	40.8
<1–<3	38	50.0

Results in Table 4 revealed that on the degree of development of intercultural competence, a great majority of 76 respondents or 86.8% had "highly positive" result in terms of intercultural attitudes. The majority or 60.5% (46 respondents) obtained "very high" competency result in terms of intercultural knowledge. Moreover, in terms of intercultural competence, the majority of 39 respondents or 51.3% got "very high" result. Finally, a large percentage of 59 of 76 respondents or 77.6% scored "very high" in terms of the overall degree of development for intercultural competence.

Table 5 presents the correlation between the moderating and independent variables. Herein, ethnicity claimed significant relationship to task-involving climate and revealed that Bukidnon displayed as the highest task-involved member followed by the Subanon. Furthermore, ethnicity shared

28% to the task-involving climate. Moreover, the duration of rehearsal disposed linear relationship ($r = 0.287$) to task-involving climate but the inverse relationship ($r = -0.407$) to ego-involving climate. These would mean that an increase in the duration of rehearsal is accompanied by an increase in the level of task-involving climate but a decrease in ego-involving climate. Moreover, the duration of rehearsal contributes 8.24% to the task-involving climate and 16.57% to the ego-involving climate as perceived by the respondents. Meanwhile, the frequency of rehearsal exposed inverse linear relationship ($r = -0.309$) to task-involving climate but the linear relationship ($r = 0.360$) to ego-involving climate. That said, an increase in the frequency of rehearsal is paralleled with a decrease in the level of task-involving climate and an increase in ego-involving climate. Furthermore, the frequency of rehearsal predicts 9.55% to the task-involving climate and 12.96% to the ego-involving climate.

Table 2: Duration of rehearsal, frequency of rehearsal, number of ethnic dances learned, and dance experience of the respondents

Respondents duration of rehearsal/frequency of rehearsal/ number of ethnic dances learned/ dance experience	Number of respondents (n=76)	Percentage
Duration of rehearsal (hours per session)		
4–5	44	57.9
2–3	32	42.1
0–1	0	00.0
Frequency of rehearsal (no. of sessions per week)		
6–7	10	13.2
4–5	16	21.1
2–3	0	00.0
0–1	50	65.8
Number of ethnic dances learned		
25–32	2	2.6
17–24	5	6.6
9–16	34	44.7
1–8	35	46.1
Dance experience (years)		
>16	1	1.3
12–<16	6	7.9
8–<12	17	22.4
4–<8	26	34.2
<1–<4	26	34.2

Table 6 presents the correlation between moderating and dependent variables. It showed that all of the correlations between the moderating and dependent variables declare no significant relationships since the computed probability values exceeded to the set level of significance ($P > 0.05$).

Table 7 revealed that in terms of the correlation between independent and dependent variables, all of the relationships existing between the independent variable of ego-involving climate and the dependent variable of intercultural competence: Attitudes, knowledge, and skills showed no significant relationship as revealed by the computed probability values that exceeded to the set level of significance ($P > 0.05$) with $P =$ 0.972, 0.613, 0.713, and 0.947, respectively. In the contrary, all of the relationships between the independent variable of task-involving climate and the dependent variable of intercultural competence ($P = 0.000$): Intercultural attitudes ($P = 0.000$), intercultural knowledge ($P = 0.001$), and intercultural skills ($P = 0.002$) were viewed significant since the computed probability values are lesser than the set level of significance ($P < 0.05$). Furthermore, the relationships established are

Table 3: Perceived motivational dance climate in terms of task- and ego-involving climate of the respondents

Respondents perceived motivational dance climate	Qualitative description	Number of respondents (n=76)	Percentage
Task-involving climate			
>71	Very high	71	93.4
58–71	High	5	6.6
44–57	Moderate	0	0.0
30–43	Low	0	0.0
<30	Very low	0	0.0
Ego-involving climate			
>67	Very high	8	10.5
55–67	High	12	15.8
42–54	Moderate	17	22.4
29–41	Low	17	22.4
<29	Very low	22	28.9

Table 4: Intercultural competency in terms of attitudes, knowledge, skills, and overall intercultural competency of the respondents

Respondents intercultural competency	Qualitative description (degree of development)	Number of respondents (*n*=76)	Percentage
Intercultural attitudes			
>25	Highly positive	66	86.8
21–25	Positive	10	13.2
16–20	Moderately positive	0	0.0
11–15	Negative	0	0.0
<11	Very negative	0	0.0
Intercultural knowledge			
>22	Very high	46	60.5
18–22	High	29	38.2
13–17	Moderate	1	1.3
8–12	Low	0	0.0
<8	Very low	0	0.0
Intercultural skills			
>22	Very high	39	51.3
18–22	High	35	46.1
13–17	Moderate	2	2.6
8–12	Low	0	0.0
<8	Very low	0	0.0
Over-all competency			
>67	Very high	59	77.6
55–67	High	17	22.4
42–54	Moderate	0	0.0
29–41	Low	0	0.0
<28	Very low	0	0.0

Table 5: Correlation between the moderating variables and perceived motivational dance climate in terms of task- and ego-involving climate as an independent variable

Moderating variables	Independent variable Perceived motivational dance climate	
	Task-involving	Ego-involving
Age		
r-value	−0.201	0.085
P-value	0.082	0.466
r^2 (%)	4.04	0.72
Sex		
r-value	−0.030	0.125
P-value	0.797	0.282
r^2 (%)	0.09	7.95
Ethnicity		
f-value	2.851**	1.348
P-value	0.007	0.230
r^2 (%)	28	15.52
Membership		
r-value	−0.045	−0.045
P-value	0.698	0.702
r^2 (%)	0.20	0.20
Duration of rehearsal		
r-value	0.287**	−0.407**
P-value	0.012	0.000
r^2 (%)	8.24	16.57
Frequency of rehearsal		
r-value	−0.309**	0.360**
P-value	0.007	0.001
r^2 (%)	9.55	12.96
Number of ethnic dance learned		
r-value	0.024	0.037
P-value	0.837	0.751
r^2 (%)	0.06	0.14
Dance experience		
r-value	−0.009	0.037
P-value	0.940	0.749
r^2 (%)	0.008	0.14

If *P*-value>0.05 level (2-tailed), not significant; If *P*-value < 0.05 level (2-tailed), significant (**)

linear because all of the resulting Pearson *r* value signs are positive. Meaning, an increase of task-involving climate is parallel with an increase in intercultural attitudes, intercultural knowledge, intercultural skills, and intercultural competence in general. Eventually, task-involving climate contributes 24.40% to intercultural attitude, 13.03% to intercultural knowledge, 12.11% to intercultural skills, and 21.62% to intercultural competence.

DISCUSSION

The data from the current study indicated that ethnicity claimed a significant relationship to task-involving climate. Accordingly, task-involved individuals in the dance contexts are more likely to exhibit adaptive achievement behaviors such as working hard and persevering in challenging situations, regardless of the performers' perceived level of ability (Hancox, 2014). On the other hand, duration of rehearsal disposed linear relationship to task-involving climate but the inverse relationship to ego-involving climate, indicating that an increase in the duration of rehearsal is accompanied with an

Table 6: Correlation between moderating variables and intercultural competency in terms of attitudes, knowledge, skills, and overall intercultural competency as a dependent variable

Moderating variable	Dependent variable Intercultural competence			
	Intercultural attitudes	Intercultural knowledge	Intercultural skills	Overall intercultural competence
Age				
r-value	−0.099	−0.074	0.055	−0.042
P-value	0.397	0.526	0.635	0.717
r^2 (%)	0.98	0.55	0.30	0.18
Sex				
r-value	−0.010	0.084	−0.031	0.017
P-value	0.929	0.472	0.788	0.881
r^2 (%)	0.01	0.71	0.10	0.03
Ethnicity				
f-value	1.671	1.172	0.743	1.265
P-value	0.114	0.327	0.669	0.272
r^2 (%)	18.55	13.78	9.24	14.72
Membership				
r-value	−0.163	−0.072	0.125	−0.036
P-value	0.158	0.534	0.280	0.758
r^2 (%)	0.03	0.52	1.6	0.13
Duration of rehearsal				
r-value	0.026	−0.035	0.106	0.038
P-value	0.827	0.763	0.364	0.743
r^2 (%)	0.07	0.12	1.12	0.14
Frequency of rehearsal				
r-value	−0.046	0.028	−0.090	−0.042
P-value	0.694	0.807	0.437	0.720
r^2 (%)	0.76	0.76	0.76	0.76
Number of ethnic dance learned				
r-value	−0.041	0.064	0.037	0.027
P-value	0.725	0.581	0.754	0.820
r^2 (%)	0.17	0.41	0.14	0.07
Dance experience				
r-value	−0.088	0.006	0.015	−0.023
P-value	0.449	0.960	0.900	0.844
r^2 (%)	0.77	0.004	0.02	0.05

If *P*-value >0.05 level (2-tailed), not significant; If *P*-value <0.05 level (2-tailed), significant (**)

increase in the level of task-involving climate but a decrease in ego-involving climate. Proper scheduling of rehearsal is really essential in the attainment of proper training, discipline, and fortitude required to become a serious student of dance or professional dancers (LeFerve, 2012).

In contrary to duration, frequency of rehearsal exposed inverse linear relationship to task-involving climate but linear relationship to ego-involving climate. That is, an increase in the frequency of rehearsal is paralleled with a decrease in the level of task-involving climate and an increase in ego-involving climate. LeFerve (2012) pointed out that in any dance competitions, academies, departments, studios, and companies, rivalries abound. It can be assumed that punishment for mistakes and even rivalry and unequal recognition may be felt heavier whenever a troupe often meets for rehearsals,

Table 7: Correlation between perceived motivational dance climate in terms of task- and ego-involving climate as an independent variable and intercultural competency in terms of attitudes, knowledge, skills and overall intercultural competency as a dependent variable

Independent variable Perceived motivational dance climate	Dependent variable Intercultural competency			
	Intercultural attitudes	Intercultural knowledge	Intercultural skills	Intercultural competence
Task-involving climate				
r-value	0.494**	0.361**	0.348**	0.465**
P-value	0.000	0.001	0.002	0.000
r^2 (%)	24.40	13.03	12.11	21.62
Ego-involving climate				
r-value	0.004	0.059	−0.043	0.008
P-value	0.972	0.613	0.713	0.947
r^2 (%)	0.002	0.348	0.185	0.006

If P-value >0.05 level (2-tailed), not significant; If P-value <0.05 level (2-tailed), significant (**)

especially for nearer performances. In addition, teachers' attitudes and methods shift slightly as performances near. Being less tolerant of mistakes, paying more attention to dancers with leading roles, and encouraging students to outperform their peers are all plausible responses to the stress an approaching performance date could cause teachers (Miulli and Nordin-Bates, 2011).

It is also inferred in the present findings that the degree of development for intercultural competence such as attitudes, knowledge, and skills is not directly influenced by the variables of age, sex, ethnicity, membership, frequency and duration of rehearsal, number of ethnic dances learned, and dance experience. These exclusive findings conformed with Deardorff's Pyramid Model of Intercultural Competence, asserting that intercultural competence is a process, "a lifelong process." There is no one point at which an individual becomes completely interculturally competent. Thus, it is important to pay as much attention to the development process as one does to the actual aspects of intercultural competence and as such, critical reflection becomes a powerful tool in the process of intercultural competence development (Deardorff, 2006).

The study also showed that an ego-involving climate has no significant influence on the degree of development for intercultural attitudes, knowledge, and skills and would not determine intercultural competence. Researchers have concluded that an ego-involving motivational climate may contribute to potentially detrimental self-evaluation tendencies and the compromised welfare of dancers (Carr and Wyon, as cited in Quested and Duda, 2009). In the contrary, it is inferred that task-involving climate has a significant influence on the degree of development for intercultural attitudes, knowledge, and skills and would determine intercultural competence. Accordingly, encouragement for self-referenced judgments of ability promotes the adoption of a more task-focused goal involvement in which mastery and improvement are considered criteria for success. Task-involved individuals are more likely to exhibit adaptive achievement behaviors such as working hard and persevering in challenging situations, regardless of the performers' perceived level of ability. Hence, task-involving climates have found to be predictive of benefits such as greater self-determined motivation for engagement in physical education and higher levels of positive affect in vocational dancers (Hancox, 2014).

CONCLUSION

This study helps in providing orientation, encouragement to put into practice (underlying strategies and methodologies), and practical support for the development of intercultural competence among dance troupes, classrooms, and other learning contexts through dance experiences in a favorable dance environment for the dancers' welfare and the quality of their engagement. In conclusion, no significant relationship existed between the independent variable of ego-involving climate and the dependent variable of intercultural competence: Attitudes, knowledge, and skills. Nonetheless, all of the relationships between the independent variable of task-involving climate and the dependent variable of intercultural competence and its components: Intercultural attitudes, intercultural knowledge, and intercultural skills established significance. These mean that a task-involving climate has a significant influence on the degree of development for the intercultural attitudes, knowledge, and skills and would greatly affect intercultural competence acquisition.

Recommendation

Based on the findings, the researcher recommended that dance educators, teachers, choreographers, and directors are encouraged to provide a positive and favorable atmosphere and to creating task-involving climate. That ethnic dance be fully integrated as a valuable part of the educational curriculum throughout the country in the form of cultural education. Universities and even high school institutions are also encouraged to establish cultural dance troupes. Moreover, artistic directors and choreographers are commended to research more ethnic dances to be included in their troupes' dance repertoires and encouraged to preserve the authenticity of its choreography. Finally, further research is encouraged to be conducted in a much wider scope among established cultural dance troupes throughout the country.

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Review Article

Construction of physical fitness norms for college student

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ABSTRACT

Physical fitness assists a sportsman in learning specific skills from a solid base over which he can develop merit in the particular game that he is involved. Sportsman concentrates on the development of speed, strength, ability, flexibility, endurance, etc. Physical fitness can be described as a condition that helps us look feet and do our best physical fitness that involves the performance of the heart and kings and the muscles of the body and since what we do with our bodies also affects what we can do with our minds, fitness influences to some degree qualities such as mental alertness and emotional stability. The purpose of the present study was to construct the physical fitness norms for college students of Gujarat University, Ahmedabad. In this study, 100 men students were randomly selected for this study. The age between 18 and 25 years. A total of 100 men students have been tested that the AAHPERD youth fitness test was used as a research tool. I measuring explosive power, muscular endurance, agility, strength, speed, and cardiorespiratory endurance ability through the respective test. The test was standing broad jump, bent-knee sit-ups, shuttle run, pull-ups, 50-yard run, and 600-yard run or walk test which was taken by researchers on subjects. The result indicates that the test norms as poor, fair, average, good, very good, and excellent.

Keywords: AAHPERD youth fitness test, College students, Physical fitness

INTRODUCTION

The performance level of sportsperson in various games and sports is considerably improving day by day. The past century and particularly the recent decades have witnessed a revolution in the field of sports for grooming young talent. The modern scientific way of sports training is different from that of the early period. For higher performance, the adaptive functions of the organism are indispensable for optimum development. Physically fitness is when you are using your body. Fitness is anything, including being fit. Being physically fit means to have your body are working well. Physical fitness has been defined as the development and maintenance of a sound physique and soundly functioning organs, to the end that the individual realizer in optimum measures his capacity for physical activity as well as for mental accomplishment unhampered by physical drains or by a body lacking in physical strength and vitality.

The term physical fitness in view of a coach is something different. In their view, the term physical fitness denotes the physical capacity to tackle the external load that is placed by various exercises and excel in physical performances of the various sports and games situations. Physical fitness is most easily understood by examining. Physical fitness is of two types, they are (1) skill-related and (2) health-related physical fitness. Skill-related fitness components are speed, power, agility, balance, coordination, and reaction time. Health-related components are cardiorespiratory endurance, muscular strength, muscular endurance, and flexibility. Endurance is the ability to deliver oxygen and nutrients to tissues and to remove wastes over sustained periods of time. Long runs and swims are among the methods employed in measuring this component muscular strength that is the ability to a muscle to exert force for a brief body strength. As like, can be measured by various lifting exercises, push-ups are often used to test the endurance of arm and shoulder muscles and flexibility is the ability to move joints and use muscles through their full range of motion. The sit and reach are a measure of flexibility of the lower back and back of the upper legs exercise that must become one of those things that are done without question.

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OBJECTIVES OF THE STUDY

The purpose of the study has been designed to construct the norms for youth physical fitness of college students.

SELECTION OF THE SUBJECT

In the research work, only male college students of the Gujarat University, Ahmedabad, have been chosen as characters. A total of 100 students were randomly selected. The student age group of 18–25 was chosen.

PROCEDURE

On the selected subjects to measure of physical fitness of college students. AAHPERD youth fitness test was conducted on college students. The skill-related physical fitness test items/ variables and coefficient of correlation are shown in Table 1.

A total of 100 male college students from Gujarat University, Ahmedabad, Gujarat, India, have been tested, and AAHPERD youth fitness test was conducted to them. AAHPERD youth fitness test battery has been administered to selected subject.

STATISTICAL PROCEDURE

The relevant data collected from the selected subject through AAHPERD youth fitness battery test were evaluated according to the statistical percentage method and analysis.

Table 1: AAHPERD youth fitness test variables and coefficient of correlation are as under

Test Serial Number	Test variables	Coefficient of correlation
1.	Standing broad jump	Explosive power
2.	Bent knee sit-ups	Muscular endurance
3.	Shuttle run	Agility
4.	Pull-ups	Strength
5.	50-yard run	Speed
6.	600-yard run/walk	Cardiorespiratory endurance

RESULTS

To determine, one the basis of the hull scale norms in the performance of AAHPERD youth physical fitness test of (1) standing broad jump, (2) bent knee sit-ups, (3) shuttle run, (4) pull-ups, (5) 50-yard run, and (6) 600-yard run/walk tests for college men students. The student performance following conclusions in poor, fair, average, good, very good, and excellent is shown in Table 2.

DISCUSSION

Table 2 reveals the construction of norms for standing broad jump, bent knee sit-ups, shuttle run, pull-ups, 50-yard run, and 600-yard run/walk test subjects wise performance indicating that the poor, fair, average, good, very good, and excellence.

Table 2 reveals that the construction of norms, total percentage-wise performance indicating that 59 total percentage was poor, 86 total percentage were fair, 136 total percentage was average, 123 total percentage was good, 131 total percentage was very good, and 65 total percentage was excellence.

Table 2 also reveals the construction of norms, gross average wise performance indicating that 9.83 gross average was poor, 14.33 gross average was fair, 22.66 gross average was average, 20.50 gross average was good, 21.83 gross average were very good, and 10.83 gross average was excellence. Therefore, we can say that most of the student average, good, and very good performance achieved of AAHPERD youth fitness test norms.

CONCUSSION

On the basis of the results obtained from the statistically analyzed data on physical fitness variables, the effects of AAHPERD youth fitness test norms have significantly contributed to improve physical fitness variables,

Table 2: Significance of difference of the hull scale norms in the performance of AAHPERD youth fitness test of college men students

Test Serial Number	Variable	N	Poor %	Fair %	Average %	Good %	Very good %	Excellence %
1.	Standing broad jump	100	10	16	20	24	17	13
2.	Bent knee sit-ups	100	08	09	22	16	31	14
3.	Shuttle run	100	09	12	19	20	29	11
4.	Pull-ups	100	12	17	29	14	17	11
5.	50-yard run	100	14	21	29	20	14	02
6.	600-yard run/walk	100	06	11	17	29	23	14
Total percentage (%)			59	86	136	123	131	65
Gross average (%)			9.83	14.33	22.66	20.50	21.83	10.83

namely, strength, speed, explosive power, agility, and cardiorespiratory endurance. To remain fit throughout life, there is a constant need for awareness of different parameters which support the overall well-being of health. To excel in sports, one must have a high level of fitness and endurance because success in sports is ultimately the result of a high degree of important role in emotional feelings of the individual. Physical fitness and wellness for sports are also supported by the good quality of nutrition with proper training. Overall fitness plays a very important role in all aspects of life.

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Research Article

Motivation and effective teaching among pre-service physical education teachers in higher education institutions in Thailand

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ABSTRACT

A previous study from Claypan (2014) found that the pre-service teachers who were teaching these subjects had a low level of effectiveness. This is because there are many responsibilities during their practicum, such as teaching plans and coaching, among others. They focused on their assignments to finish on time, as well as having low levels of confidence in teaching. Such reasons contributed to the low level of effectiveness in teaching. Hence, this study aims to investigate the level of motivation and teaching effectiveness among pre-service physical education teachers during their practicum. Moreover, it aims to examine the relationship between their motivation and teaching effectiveness. Using the survey method, this study collected data from 157 pre-service physical education teachers doing their practicum in five higher education institutions in the border provinces of Southern Thailand. The sources of data were questionnaires on motivation and teaching effectiveness in physical education. The results showed that the motivation and teaching effectiveness of the respondents were at a high level. Furthermore, it was found that there was a significant positive relationship between the motivation and teaching effectiveness of the participants. This study hopes to guide and support the pre-service physical education teachers during their practicum to increase their motivation and effective teaching.

Keywords: Effective of physical education teaching, Motivation for teaching, Pre-service physical education teacher

INTRODUCTION

The study by the National Statistical Office (2012) found that there were only 20% of children in Thailand, who played sports and exercise regularly. Such a result may lead to obesity, poor health, and excessive weight in children due to not engaging in exercise regularly. However, these problems can be minimized through exercising and playing sports on a regular basis. For this reason, the Thai Ministry of Education has established the basic education core curriculum for all students, whereby physical education class is one of the eight important learning areas (OBEC, 2008). All learners since kindergarten until high school are required to learn physical education subjects for their well-being and health (OECD/UNESCO, 2016). This is because teaching and learning in physical education classes employ exercising and playing as teaching tools.

The objectives of physical education learning emphasize the students' participation in physical activities and the acknowledgment of the benefits of playing sports and exercises (OBEC, 2008). Hence, the teachers who are teaching physical education classes must have extensive knowledge of true movement skills, human anatomy, physiology, and playing sports as well as being able to play sports well. Moreover, they should also be adept at teaching strategies and techniques for more effective teaching. However, in the exploratory study of Pramann and Pramann (2016), it was found that 52.4% of the teachers who were teaching physical education classes did not graduate from the physical education program. This issue affected the students' achievement and learning. This is because physical education teachers are an important factor in developing the students' achievement. Consistent with Tulyakul *et al*. (2018a) found that trained physical education teachers were better than untrained physical education teachers in terms of classroom management strategies and teaching effectiveness in primary schools. Thus, educators who are teaching physical education classes must be graduates of the physical education program only.

For students to become physical education teachers, they must complete 4 years (eight semesters) of the study

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and do their practicum in a school for 1 year. Moreover, during their practicum, they must teach around 8 to 12 h and conduct their own research and submit their research, portfolio, and teaching plan to their universities (Faculty of Education; Thaksin University, 2017). In addition, pre-service physical education teachers have to help in various tasks assigned by the school during their practicum, such as sports coaching and teaching classes. These issues can lead the pre-service physical education teachers to work very hard each week. Hence, their teaching effectiveness may decrease because they focus more on tasks other than teaching. Furthermore, working very hard can possibly reduce their motivation due to tiredness, fatigue, and stress (Han and Yin, 2016). Thus, it is necessary to investigate the level and the relationship between motivation and effective teaching among pre-service physical education teachers to improve and develop the teaching and learning process in the future.

Objectives of the Study

This study aims to investigate the relationship between the motivation and the effective teaching of pre-service physical education teachers in five universities in the border provinces of Southern Thailand. Furthermore, the study aims to examine the levels of motivation and teaching effectiveness of pre-service physical education teachers.

Research Hypotheses

There is no significant relationship between the motivation and the effective teaching of pre-service physical education teachers in five universities in the border provinces of Southern Thailand.

METHODOLOGY

Population

The participants in the study were 157 pre-service physical education teachers from five universities in the border provinces of Southern Thailand, who were doing their practicum in primary and secondary schools.

Data Collection Method

Self-administered questionnaires sent through the postal service were the sources of data. The questionnaires were distributed to 157 participants, but only 145 sets of questionnaires were returned. Of the 145 questionnaires, only 141 were subjected to analysis because there were four sets that were not completed.

Instruments

This study employed the questionnaire adapted from Tulyakul (2019). It consists of three parts to elicit the data from respondents. The background of the respondents was asked in the first part, for example, age, gender, and institution, among others. The second part involves questions about effective teaching such as learning environment and teaching strategies, among others. The last part of the questionnaire includes questions about the motivation for teaching physical education. The second and last parts of the questionnaire had the reliability values of 0.89 and 0.84, respectively. Hair *et al*. (2017) state that a good questionnaire has to have coefficient of Cronbach's alpha reliability value of more than 0.70. Therefore, the questionnaire is deemed suitable for this study.

Data Analysis

The Statistical Package for the Social Sciences version 23 was used to analyze the data from the respondents, namely, the preliminary data, the level of motivation, and teaching effectiveness as well as investigate the Pearson correlation coefficient.

RESULTS

The first and second objectives of this study are to examine the levels of motivation and effective teaching of pre-service physical education teachers in five universities in the border provinces of Southern Thailand. Table 1 presents the category of mean to identify the levels of motivation and teaching effectiveness. Furthermore, Table 2 illustrates the mean values and standard deviation in terms of motivation and effective teaching.

Table 2 shows the mean value and standard deviation of overall motivation for teaching are 3.91 and 0.60, respectively. In addition, the mean value of effective teaching is 3.64 and its standard deviation is 0.58. The mean of motivation and effective teaching indicates a high level.

The last purpose of the study is to examine the relationship between the motivation and the effective teaching of pre-service physical education teachers in five universities in the border provinces of Southern Thailand. To meet this purpose, Table 5 shows the accepted guidelines for interpreting the correlation coefficient between motivation and effective teaching. Moreover, Table 3 presents the results of the coefficient (r) in motivation and effective teaching.

Table 3 shows that there is a strong positive relationship

Table 1: Category of mean to identify the level of motivation and teaching effectiveness

Category of mean	Description
1.00–1.80	Very low level
1.81–2.60	Low level
2.61–3.40	Moderate level
3.41–4.20	High level
4.21–5.00	Very high level

Source: Kamaruzzaman, 2009

Table 2: Mean, standard deviation, and level of motivation and effective teaching

Variables	*n*	Mean	Std. Deviation	Level
Motivation for teaching	141	3.91	0.60	High
Effective teaching	141	3.64	0.58	High

Table 3: The relationship between motivation and effective teaching among pre-service physical education teachers

Variables	Effective teaching	Pre-service physical education teachers (*n*=141)
Motivation for teaching	Correlation coefficient	0.722**
	Significance level	0.001*

*P<0.05, **positive relationship

between motivation and effective teaching among pre-service physical education teachers (r = 0.772, $P < 0.05$). Hence, the hypothesis of this study was rejected.

DISCUSSION

This study aimed to investigate the levels of motivation and effective teaching and to examine the relationship between motivation and effective teaching among pre-service physical education teachers in five universities in border provinces of Southern Thailand.

Firstly, this study found that the mean value of motivation for teaching was high. This is because all of the respondents in this research were students who chose to study physical education programs. Furthermore, they specialized in sports and physical education. They also had the passion and desire to study physical education as their field of specialization since they wanted to become physical education teachers after they graduate. Moreover, they were taught by experts during their practicum. As a result, these factors may have contributed to the high level of motivation for teaching among pre-service physical education teachers. According to Lenon (2015), students enjoy and are happy when they teach subjects under their specialization and are able to create a lesson that becomes more interesting. Tulyakul (2019) also points out that the motivation for teaching refers to the reason that physical education teachers have for teaching and deciding to teach as well as including their efforts to sustain their teaching. In addition, the finding of this study, it seems that both Tulyakul *et al*. (2019) have investigated with the physical educators in the primary school amount 72 teachers, the result found that the motivation level of physical educators is high level as well. This is due to passion, expertise, and happiness in physical education teaching.

Secondly, this study found that the mean value of effective teaching was high. Perhaps, this is because all of the respondents of this study were students who chose to study physical education programs. Hence, they were experts in sports, exercise, and physical education teaching. The program required the students to do their course work for 4 years, studying different subject areas such as sports, human anatomy, physiology, sports skills and instruction, teaching and assessment in physical education, and classroom management strategies. Moreover, they were required to complete their practicum for 1 year to experience learning (Faculty of Education, Thaksin University, 2017). Thus, the physical education curriculum is the main factor that could affect their teaching effectiveness. O'Neill and Stephenson's (2012) mention that the importance of curriculum as a guideline to improve and develop the teacher on the right track and gain a higher level of confidence in teaching; moreover, Guerriero (2015) argue that teachers who are trained before real teaching are able to create new teaching methods to cater to the students' interests and which are suitable for all students. Moreover, Tucker and Stronge (2005) state that teachers who are trained specifically in the field will positively result in teaching effectiveness. There is empirical evidence to support those reasons such as the study by Tulyakul *et al*. (2018b) which compared the trained and untrained physical educators in terms of physical education teaching effectiveness. The result found that trained physical educators were better than the untrained ones.

Finally, the hypothesis of this study was rejected. Thus, the findings from this study are consistent with that of Tulyakul *et al*. (2018b) which found a positive relationship between teacher motivation and teaching effectiveness. Furthermore, from the previous study of Muranda *et al*. (2015), it was found that there was a correlation between teaching effectiveness and teacher motivation. This is because motivation is very important to their teaching (Wlodkowski and Ginsberg, 2017). In addition, Christiana (2009) state that teachers' motivation is an important factor in student learning because a lack of motivation for teaching may result in a low level of teaching effectiveness. Han *et al*. (2015) argue that motivation for teaching has a correlation with teaching methods, effective teaching, and students' achievement.

Therefore, enhancing teacher's motivation must be recognized as necessary to become more effective educators. Giving support to motivate, the teachers may include welfare improvement, providing accommodations to teachers who do not have a home, increasing overtime pay, and giving reward to physical education teachers. Moreover, providing enough facilities to teach such as sports equipment as well as encouraging physical education teachers to attend and participate in seminars, workshops, and training to help them gain new knowledge and experience could have a positive effect on their confidence level and expertise.

Limitation of the Study

The respondents of this study were pre-service physical education teachers in five universities in the border provinces of Southern Thailand. Thus, interpreting the result should not be made for all pre-service physical education teachers in Thailand. This is to say that the results of this research should be interpreted relative to the limited context and selected respondents.

Recommendations for Future Research

Future research should take into account a greater number of participants and cover other universities in Thailand, such as universities in capital Thailand or all universities in Thailand. Moreover, future researchers can use interviews to collect data from pre-service physical education teachers relative to other information, for example, the budget of the school, teaching problems, student and teacher relationship, and job satisfaction.

CONCLUSION

This study aims to investigate the level and to examine the relationship between the motivation and the teaching effectiveness of pre-service physical education teachers in five universities in the border provinces of Southern Thailand. The study found that the levels of motivation and teaching effectiveness were high. Moreover, the study found that there is a significant relationship between motivation for teaching and effective teaching. Thus, enhancing the motivation for teaching should be done for more effective teaching.

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Review Article

Practice of yogasana for a healthy life

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INTRODUCTION

Yoga is an Indian physical culture, which can be practiced by anyone and which does not require any special equipment or clothing. However, it is required a small amount of space and a strong desire to heal their life. Our body is essential for every achievement. Not a body is the bag of a living corpse, but a disease less, strong, and healthy body. That is a body, in which there is equilibrium between physical well-being and mental well-being.

The word yoga comes from the Sanskrit word "Yuj" which means union. Yoga is said to be for the purpose of uniting the mind, body, and spirit. Maharishi Patanjali explained yoga as a Chitta Vritti Nirodhah, which means that yoga is the control of thought waves in mind. Yogic techniques are known to improve overall performance and work capacity. The aim of the yoga is to develop human consciousness from a lower level to a higher level.

Yoga has become part and parcel of physical education, and it is getting its due weightage and various levels such schools, colleges, clubs, and senior citizens are also doing yoga practices to delay the aging process and to avoid various medical alignments.

ASANAS

Asana is an integral part of yoga. Asana means a posture (sitting, standing, and sleeping). It is derived from Sanskrit word as which means to "sit." Yoga asana principle involves slow movement and maintaining poise and balance. It is based on stretching relaxation, deep breathing, body flexibility, increasing blood circulation, and concentration. Physical exercise lay emphasis on strong movements of the muscles whereas yoga opposes violent muscle movements, as they produce a large quantity of lactic acid in the muscle fibers.

ASANA FOR STRESS RELIES

Yoga, an excellent stress relief exercise, involves a series of moving and stationary poses or postures combined with deep breathing. Mind-body exercise yoga can strengthen our body's natural relaxation response and bring into a healthy balance.

Yoga uses the body to exercise and controls the mind so that at a later stage, the body and the mind together may harmonize with the soul. The yogasanas effect and penetrate every single cell and tissues, making them come to life.

- Yoga is unique that it recuperates (get well) the system
- No cellular exhaustion (tiredness) occurs
- Due to internal massage, the cells are made to liberate their toxins more efficiently
- Blood flow is increased with augmented oxygen delivery to the tissues

- Yoga is one of the few physical practices that increase both muscular strength and flexibility
- Yoga offers protection from things like repetitive strain injury as it balances opposing muscles and stretches over tenseones
- Yoga keeping muscles and ligaments healthy and posture correct, one can prevent problems of damage to joints
- Asana promotes and maintains the elasticity of the rib cage and intercostals muscles
- Asana helps to strengthen the diaphragm
- The lungs got stimulate through standing poses
- Amanas enhances the elimination of toxins and improves perfusion
- All asana are useful, particularly inverted poses. Backbends stimulate, forward bends recuperate, and passive possess energies the system
- Asana strengthens the body
- It prevents obesity
- It increases one's immunity.

CONCLUSION

The art and science of yoga have infinity possibilities for providing answers to most health problems troubling modern humankind. Yoga helps to improve circulation and as a result of various poses. More efficiently moves originated blood to the body cell. Make sure that when you practice yogasanas. You do not just stretch the body because the mind has to be with the body.

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Research Article

Comparing the effect of resistance and plyometric training against strength and power development

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ABSTRACT

The study was conducted to compare and evaluate the effect of three training regimens as plyometric training, resistance training, and plyometric exercise combined with resistance training. The effect was considered in terms of strength, speed, and explosive power gains. The comparison of these training regimens was made with that of 36 U20 male soccer players. Stratification was made using the playing position of the players to assign them into the three treatment groups of the plyometric, resistance, and combined group. Thus, the research design was "randomized block design." The intervention was given for each group based on the exercise prescription and training program for about 4 consecutive weeks. Based on the pre-test result, there was no a significant difference among the groups in the dependent variables. One-way ANOVA with *post hoc* test was used to test difference among the groups and to calculate the effect size partial eta-squared (ηp2) was used. The result showed that there was a significant difference among the groups in dynamic strength (speed), F (2, 33) = 5.127, $P = 0.012$, ηp2 = 0.237 and explosive power, F (2, 32) = 12.997, $P < 0.001$, ηp2 = 0.441. Thus, it was concluded that plyometric training is batter by far than resistance training.

Keywords: Dynamic strength, Explosive power, Plyometic, Resistance, Strength

INTRODUCTION

In multi-sprint team sports, like soccer, the ability to produce greater force at faster speed is essential for successful performance. Hence, training regimens with the highest event-specific adaptive stimuli (response) are too important, though varied training regimens can be available. The generic view of physical fitness in soccer includes both aerobic and anaerobic physical fitness parameters. Although aerobic segment of physical fitness is important for successful performance in soccer (Stolen *et al*., 2005), the anaerobic segment, which includes speed, strength, and power are the most important (Barnes *et al*., 2014; Faude *et al*., 2012). Thus, soccer players must perform numerous explosive actions (Turner *et al*., 2013), including jumping, sprinting, or accelerating and changing of direction, with most of these preceding the most important moments of the game as goal opportunities in a game (Arnason *et al*., 2004; Datson *et al*., 2014; Faude *et al*., 2012). Therefore, investigating for a better elucidation of the methods to improve these crucial physical fitness segments of speed and powerful actions in soccer players seems to be essential, especially for those promising young players, for whom less research is available (Datson *et al*., 2014).

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In general, soccer is the most complex sport, in which several factors may affect competitive performance or success and the weight of such factors may vary according to contextual factors (Rein and Memmert, 2016; Smith *et al*., 2018; Wilson *et al*., 2017). Power exercises have proven to be important to develop soccer players' physical fitness (Bedoya *et al*., 2015; Stojanović *et al*., 2017) for the most important demands of the game. Anaerobic fitness potentially aids the players during crucial moments of the game such as sprinting, acceleration, changes of direction, and jumping. Particularly, plyometric exercises are an effective means of physical conditioning for the development of these skill-related measures of athletic performance (Granacher *et al*., 2016).

Plyometric trainings are commonly associated with exercises that stress the muscle stretch-shortening cycle (Taube *et al*., 2012) and it involves jumping movements (Faigenbaum and Chu, 2017). Plyometric exercises have proved to induce

benefits for athletic performance (Saez de Villarreal *et al*., 2012) and injury prevention (Rossler *et al*., 2014; Stevenson *et al*., 2015). The same way, resistance training is the most commonly used method to develop strength, speed, and power (Behringer *et al*., 2011; Bedoya *et al*., 2015; Stojanović *et al*., 2017). Despite the acknowledgment that resistance and plyometric training had on athletic performance, the effect that each training had and the effect they had when done together is not addressed and there are inconsistent findings. For example, despite its positive effect, Chtara *et al*. (2008) found that resistance training cannot produce a significant level of strength and power performance.

A study has examined the effect of plyometric training combined with resistance training in addition to normal soccer training on linear speed and counter movement jump performance gains by comparing the effect with a group which received only the normal soccer training (Franco-Marquez *et al*., 2015). This study showed that plyometric training combined with resistance exercise in addition to normal soccer training can significantly improve performances in linear speed and explosive power. However, the study does not consider the exact effect that each of them had on the target physical fitness. Still a meta-analysis revealed that resistance training can improve performance measures in jumping, and running, though it reminds that younger subjects obtained the greatest enhancements in aforementioned performance parameters' (Behringer *et al*., 2011). Reviews in relation with plyometric training indicated that it can significantly aid explosive power performance gains (Bedoya *et al*., 2015; Ramirez-Campillo *et al*., 2020; Stojanović *et al*., 2017; 25. Slimani *et al*., 2017), though all these were with that of only female athletes and soccer players. A study even has compared the effect of plyometric training on power, strength, and other sport specific fitness qualities and it showed plyometric and other training can improve power and strength measures (Myer *et al*., 2006). However, the study was on female athletes who were volleyball players and aged 14–17 years.

Meta-analysis done to assess the effects of plyometric training on female player's vertical jump height confirmed that plyometric training is effective to improve performance (Ramirez-Campillo *et al*., 2020; Stojanović *et al*., 2017). What if plyometric training is combined with resistance training and what if alone compared with resistance training? For the researcher's knowledge, there is no clear information regarding the effect of plyometric training combined with resistance training and comparing plyometric training with resistance training. Thus, the ultimate of the study was comparing three training regimens which are resistance training, plyometric training, and combined training which combine plyometric exercises with resistance training in each session against power and strength gains. To this end, it was hypothesized that all these training interventions can improve strength and explosive power and there will not be significant difference among the three methods.

METHODS

Design

True experimental design has been used for this research. A randomized block design with three treatment groups named as resistance group (RG), plyometric group (PG), and combined group (CG) with a different treatment or training regimen as outlined the procedure section was used. First players were grouped based on their main playing position then randomly assigned into the treatment groups. The different position players, the common playing positions such as center backs, fullbacks, holding midfielders, outside midfielders, attacking midfielders, and strikers were randomly assigned to the three intervention groups. Thus, the randomization was after grouping of the players as different position players are expected to have a certain fitness qualities which they are believed to be better than other position players. All the players were informed about the purpose and they were volunteer to participate. Comparison of the effect and effect magnitude of each training regimen on performance gains of some selected physical fitness parameters as static strength, ballistic, or dynamic strength and explosive power has been done.

Participants

Thirty-six U20 outfield soccer players' 17 ± 3.212 years of age and 55 ± 3.580 kg of body weight were participants of the study. The researcher has made these trainees the study participant purposely because of convenience, familiarity and they are the one at the age level to have the predisposition for sport specific physical fitness. All of the participants were informed to have only their team based normal soccer training and the study intervention exercise in their respective group which were both guided by the coach. The soccer specific training was the same for all the groups as the players were from the same team.

Experimental Procedure

Since the ultimate of the study is to compare different exercise/training regimens to improve strength and explosive power of the lower extremities, three different groups for different training intervention were used. In each treatment group, 12 players from each position assigned randomly. The first group was having resistance training for about 4 weeks. For this, the group was designated as RG. The second group, the PG, was having plyometric trainings for about 4 weeks in addition to the common soccer specific training. The third group, named the CG, received both resistance and plyometric training combined in each of the intervention sessions. Thus, each group was having their intervention specific training sessions 3 times a week and the same soccer specific training together 3 times a week.

A week before the intervention, each group was assessed in terms of their strength and explosive power the same way they are tested in the post-test. Based on their pre-test result, it was confirmed that there was no any significant difference among the groups in terms of their static strength, dynamic strength, and explosive power. A summary of the intervention training and the training program or protocol employed is outlined here under [Tables 1 and 2].

Testing Methods

Wall squat test (standardized squat test) for a static strength, ballistic strength test for elastic strength, and vertical jump test for leg explosive power were used. To get the static strength test score, each participant was given two trials and the bet was taken. The same procedure was used for the measurement of elastic strength; however, the average of the two trials was taken as one trial for the left leg and the other was for the right leg. For leg explosive power three trials of jump and reach test was given and the average score was taken.

Method of Analysis

Using the Statistical Package for the Social Sciences version 25, one-way ANOVA with a *post hoc* test was used. After identifying the significance level in difference, partial eta-squared (ηp2) was used to estimate the effect size of the intervention. For the overall analysis, the critical value was set to be 0.05.

RESULTS

The descriptive statistics depicts the mean performance scores of static strength which the participants able to hold in a wall squat (100.955 ± 10.671, 100.302 ± 26.23, and 100.994 ± 16.464 s for the RG, PG, and CG, respectively). With respect to dynamic strength, which is measured in seconds, the intervention groups achieved such a difference in mean score. When the RG had a mean value of 5.413 ± 0.756 s, the PG and CG had 4.627 ± 0.405 and 4.977 ± 0.405 each. Explosive power gain was 40.691 ± 4.027 cm for the RG and 48.439 ± 4.326 cm for the PG. The CG reached 47.675 ± 4.109 cm with that of explosive power. The RG achieved less vertical jump distance than the PG and CG.

The descriptive statistics associated with mean performance score of the three groups are reported in Table 3. The three groups do not show a significant difference in terms of the static strength gain [Table 4]. However, there is a statistically significant difference among the three intervention groups (RG, PG, and CG) in their ballistic strength gain, $P = 0.012$. The independent between-groups ANOVA yielded a statistically

Table 1: The intervention training regimen and exercise prescriptions

Week	Resistance group			Plyometric group			Combined group		
	Exercise	Repetition	Set	Exercise	Repetition	Set	Exercise	Repetition	Set
Week 1	Leg extension	7	3	Jump to box	7	3	Jump t	7	3
	Squat rock	4	3	Tuck jumps	4	3	leg extension	4	3
	Lunge	6	3	Bounding with rings	6	3	Tuck jumps	6	3
	Seated calf raise	6	3	Lateral hurdle jump	6	3	Squat rock	6	3
	Calf raise	8	3	Single leg lateral hops	8	3	Single leg lateral hops	8	3
Week 2	Leg extension	6	3	Jump to box	6	3	Jump to box	6	3
	Squat rock	6	3	Tuck jumps	6	3	Leg extension	6	3
	Lunge	8	4	Bounding with rings	8	4	Bounding with rings	8	4
	Seated calf raise	8	4	Lateral hurdle jump	8	4	Lunge	8	4
	Calf raise	8	4	Single leg lateral hops	8	4	Depth jumps	8	4
Week 3	Leg extension	10	3	Tuck jumps	10	3	Jump to box	10	3
	Squat rock	10	4	Bounding with rings	10	4	Squat rock	10	4
	Lunge	10–12	4	Lateral hurdle jump	10–12	4	Bounding with rings	10–12	4
	Seated calf raise	10–12	4	Single leg lateral hops	10–12	4	Lunge	10–12	4
	Calf raise	10–12	4	Depth jumps	10–12	4	Depth jumps	10–12	4
Week 4	Leg extension	10–12	4	Tuck jumps	10–12	4	Jump to box	10–12	4
	Squat rock	10–12	4	Bounding with rings	10–12	4	Squat rock	10–12	4
	Lunge	10–12	4	Lateral hurdle jump	10–12	4	Single leg lateral hops	10–12	4
	Seated calf raise	10–12	4	Single leg lateral hops	10–12	4	Lunge	10–12	4
	Calf raise	10–12	4	Depth jump	10–12	4	Depth jumps	10–12	4

Table 2: The 4 weeks training program

Day	Week 1	Week 2	Week 3	Week 4
Monday	Normal soccer training	Normal soccer training	Normal soccer training	Normal soccer training
Tuesday	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG
Wednesday	Normal soccer training	Normal soccer training	Normal soccer training	Normal soccer training
Thursday	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG
Friday	Normal soccer training	Normal soccer training	Normal soccer training	Normal soccer training
Saturday	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG
Sunday	Rest	Rest	Rest	Rest

Table 3: Descriptive statistics of the three treatment groups after the treatment

Performance	*n*	Mean	SD	Std. Error	95% CI for mean	
					Lower bound	Upper bound
Static strength (in seconds)						
RG	12	100.955	10.671	3.080	94.175	107.735
PG	12	100.302	26.230	7.57207	83.6357	116.9677
CG	12	100.993	16.464	4.75263	90.5320	111.4530
Total	36	100.750	18.366	3.061	94.536	106.964
Ballistic strength (in seconds)						
RG	12	5.413	0.756	0.2183	4.933	5.894
PG	12	4.627	0.595	0.172	4.248	5.005
CG	12	4.977	0.405	0.117	4.719	5.234
Total	36	5.006	0.670	0.112	4.779	5.232
Explosive power (in centimeter)						
RG	12	40.691	4.027	1.162	38.132	43.249
PG	12	48.439	4.326	1.249	45.691	51.188
CG	12	47.894	4.109	1.186	45.284	50.505
Total	36	45.675	5.395	0.899	43.849	47.500

significant effect, F (2, 33) = 5.127, $P = 0.012$, $\eta p2 = 0.237$. Thus, the null hypothesis of no differences among the three groups' means was rejected and 23.7% of the total variance is accounted for by the group membership. Comparing the groups against explosive power, the independent between-groups ANOVA yielded a statistically significant effect, F (2, 32) = 12.997, $P < 0.001$, $\eta p2 = 0.441$ and 44.10% of the total variance is accounted for by the treatment effect.

The PG significantly achieved a better dynamic strength gain than the RG, $P = 0.008$ (4.67 ± 0.595 vs. 5.413 ± 0.756 s) as they cover the 25 m hop sprinting with 0.787 s faster than the RG [Tables 3 and 5]. However, the difference between the RG and the CG was not statistically significant. The same way, the PG does not have a significant difference with the CG in the performance gain of dynamic strength.

Based on the multiple comparison, the RG achieved statistically smaller explosive power development/gain than both the PG and CG in the, $P < 0.001$ (40.691 ± 4.027 vs. 48.439 ± 4.326 and 40.691 ± 4.027 vs. 47.894 ± 4.109 cm) [Tables 3 and 5]. The PG and CG achieved 7.748 and 7.203 cm vertical jump performance gains than that of the RG, respectively. However, the explosive power gain was not significantly different between the PG and CG (vs. 48.439 ± 4.326 vs. 47.894 ± 4.109 cm).

DISCUSSION

The ultimate of the study was to compare three training regimens as resistance training (RG), plyometric training (PG), and plyometric combined with resistance training (CG). The comparison was made based on strength, dynamic strength (speed-based strength), and power development. Although it was hypothesized that the three training modalities would improve strength or power with no statistical difference, the PG and the CG showed a greater performance gain in dynamic strength and explosive power. The positive effect

Table 4: ANOVA table comparing the three groups in terms of static strength, dynamic strength and explosive power gains

Performance	Sum of squares	df	Mean Square	F	Sig.	partial eta-squared (ηp2)
Static strength						
Between groups	3.622	2	1.811	0.005	0.995	0.000
Within groups	11802.466	33	357.650			
Total	11806.088	35				
Ballistic strength						
Between groups	3.728	2	1.864	5.127	0.012*	0.237
Within groups	11.998	33	0.364			
Total	15.726	35				
Explosive power						
Between groups	448.887	2	224.443	12.997	0.000**	0.441
Within groups	569.887	33	17.269			
Total	1018.774	35				

*The mean difference is significant at the 0.05 level

Table 5: Multiple comparison of the three groups

Performance	Treatment group	Treatment group	Mean difference	Std. Error	Sig.	95% CI	
						Lower bound	Upper bound
Ballistic Strength	RG	PG	0.787*	0.246	0.008	0.183	1.391
		CG	0.437	0.246	0.194	–0.167	1.041
	PG	RG	–0.787*	0.246	0.008	–1.391	–0.183
		CG	–0.350	0.246	0.342	–0.954	0.254
	CG	RG	–0.437	0.246	0.194	–1.041	0.167
		PG	0.350	0.246	0.342	–0.254	0.954
Explosive Power	RG	PG	–7.748*	1.697	0.000	–11.911	–3.585
		CG	–7.203*	1.697	0.000	–11.366	–3.040
	PG	RG	7.748*	1.697	0.000	3.585	11.911
		CG	0.545	1.697	0.945	–3.618	4.708
	CG	RG	7.203*	1.697	0.000	3.040	11.366
		PG	–0.545	1.697	0.945	–4.708	3.618

*The mean difference is significant at the 0.05 level

of plyometric training alone and plyometric combined with resistance training can have a physiological reason. Muscle power development here for the PG and CG, may be attributed to enhanced, increased muscle size and architecture, improved intermuscular coordination, greater excitability of the stretch reflex, and increased neuromuscular activation (Markovic and Mikulic, 2010; Slimani *et al*., 2017). A total of 12 plyometric or plyometric plus resistance training sessions (3 sessions per week, and for 4 weeks), compared to a control group (RG), found significantly more improvement in explosive power performance of 7–8 cm. This superior improvement can be attributed to adaptations such as increases in the thickness, fascicle length and pennation angle of knee flexor and extensor muscles (Ullrich *et al*., 2018). A number of study findings goes in parallel with this study as plyometric or plyometric plus resistance training can positively affect power performance of lower limbs (Ozbar *et al*., 2014; Ramirez-Campillo *et al*., 2018; Ramirez-Campillo *et al*., 2016; Ramirez-Campillo *et al*., 2016; Ullrich *et al*., 2018). The same thing is true with the effect of plyometric training with the upper limbs. Plyometric training is found to be effective in developing upper limbs power development of golf players (Fletcher and Hartwell, 2004).

Regarding the frequency of the intervention training, less than 3 sessions per week has even shown to produce substantial improvement (Ozbar *et al*., 2014; Ramirez-Campillo *et al*., 2018; Ramirez-Campillo *et al*., 2016; Ramirez-Campillo *et al*., 2016; Rosas *et al*., 2017) after plyometric trainings. Here, with this studies the effect ranges ES= 0.8–1.47.

A systematic review with a meta-analysis was done to assess the effects of plyometric jump training in female soccer player's vertical jump height (Ramirez-Campillo *et al*., 2020). The magnitude of the main effect was moderate (ES = 1.01, $P = 0.002$). This study thus is in line with the findings of the present study as it also recommends that plyometric exercises are effective in players for the improvement of vertical jump height. Thus, plyometric exercises are the best stimulus to cause the most possible adaptive response in terms of explosive power. Moreover, it is also clear that the potent effect of plyometric training can be identified after 4 weeks. Furthermore, power training consists of a combination of resistance training and strength-based plyometric exercises can also have a significant adaptive effect on strength-based speed (dynamic/ballistic) and power. The same way, 4 weeks plyometric training and as well 8 weeks plyometric training can significantly improve explosive power of lower limbs (Voisin and Scohier, 2019). From a training frequency perspective, 2 weekly sessions of strength training are sufficient to increase a player's force production (Silva *et al*., 2016).

No matter what level of load is assigned to resistance exercise, it is far more important to exert as much effort (fastest concentric speed) as possible per repetition, otherwise, the training effects are reduced (Sakamoto *et al*., 2016). This is the reason that can be taken for the RG (resistance training alone) not to have an effect as big as that of the PG or CG. Thus, the utilization of stretch-shortening cycle effects, with increased power, may give a further training edge. Coaches ought to be aware that it is not only the amount of force production; instead it is also how explosive the force generation is. The adaptation which can be expected is also a function of the force generation speed or explosiveness. Thus, speed of action or force generation and displacement for every repetition, rather than smooth repetitiveness is too critical (Sakamoto *et al*., 2016). In general, force exertion at a faster rate and speed is the key to accomplish desired functional needs (Lyttle *et al*., 1996). Thus, trainings aimed at improving power and speed of a specific muscle is advised to focus on both speed of contraction and power (Lyttle *et al*., 1996; Kraemer *et al*., 1996). Exaggerating the effect of speed of movement (effort) over that of intensity (load), recent studies confirm that effort rather than intensity has a greater effect on training effectiveness when the concern is power and dynamic strength (Pareja-Blanco *et al*., 2014, Gonzalez-Badillo *et al*., 2014). Thus, maximum effort in every repetition is crucial, no matter what intensity, for optimizing training outcomes (Kuroda and Sakamoto, 2016).

CONCLUSION

Plyometric exercises are the best stimulus to cause the most possible adaptive response in terms of strength, speed, and explosive power. Moreover, it is also clear that the potent effect of plyometric training can be identified after 4 weeks. Furthermore, a combination of resistance training and strength-based plyometric exercises can have a significant adaptive effect on strength-based speed (dynamic/ballistic) and explosive power. Plyometric exercises which involve stretch shortening cycle do enhance force, power output, work done, and thus overall athletic performance.

Plyometric trainings are better by far than resistance training alone in improving soccer specific anaerobic fitness including strength, speed, and most importantly explosive power. If resistance trainings are to be part of the preparation or maintenance of aerobic fitness, it is too important to combine it with plyometric exercise for a better sport specific preparation.

When the preparation is short for a soccer season, the kind of training regiments introduced in this study can be valuable to enable players to get fit of sport specific anaerobic physical fitness demands such as speed, strength, and power. Short preparation periods of 3–5 weeks in the contemporary soccer are the common challenges. Thus, this study might be contributing as informative regarding how to improve some soccer specific finesses.

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Research Article

Current form and physical fitness of disabled athletes (male) participating in wheelchairs racing In Ho Chi Minh

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ABSTRACT

Using routine research study in science to conduct summarizing documents, interviewing, reliability testing, and notification properties, the theme has determined five evaluation criteria for form and physical fitness. Thereby providing information about current form and physical fitness of disabled male athletes participating in wheelchairs racing in Ho Chi Minh City.

Keywords: Form, Ho Chi Minh City, Physical fitness of disabled athletes, Wheelchair racing

RATIONALE

In modern sport, evaluating exactly current form and physical fitness of athletes plays an important part in training process for a long time. Especially for disabled athletes, evaluating rightly the current form and physical fitness helps us to understand clearly about what factors having impact on disabled athletes' health to give the proper diet to them. Therefore, determining completely and scientifically the criteria will be seen as a basis to appraise exactly the current form and physical fitness of disabled athletes in Ho Chi Minh City. Thereby, the trainers can develop training plan, make a selection of exercises for every single athlete in a suitable way. Realizing the importance of it, we have carried out the study:

"*Current form and physical fitness of disabled athletes (male) participating wheelchair racing in Ho Chi Minh.*"

The study is targeting to determine the criteria in purpose of evaluating current form and physical fitness of disabled athletes (male) participating in wheelchair in Ho Chi Minh City.

Method

Pedagogics, anthropometry, and mathematical statistics.

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Number of study object

Twenty disabled athletes (male) participating in wheelchair racing in Ho Chi Minh City.

STUDY RESULTS AND DISCUSSION

Determining Evaluation Criteria about form and Physical Fitness of Disabled Athletes (Male)

There are three steps to determine evaluation criteria about form and physical fitness of disabled athletes (male) participating in wheelchair racing in Ho Chi Minh City.

- **Step 1:** Collecting documents, research works mentioned about disabled athletes participating in wheelchair racing of domestic and foreign authors
- **Step 2:** Interviewing some trainers, coaches, or officials who have experience in training disabled athletes driving wheelchair.
- **Step 3:** Checking reliability and notification properties

Collecting Documents, Research Works Mentioned about Disabled Athletes Participating in Wheelchair Racing of Domestic and Foreign Authors

Collecting documents of domestic and foreign authors, basing on the specific traits of disabled athletes and current conditions in local place as well as vehicle testing, we have made a selection of specific criteria as below:

- Form: 15 criteria
- Physical fitness: 15 criteria

Interviewing professors, specialists

According to the above criteria, the theme conducts making questionnaires and interviewing 28 people including coaches, trainers, specialists about the importance of each test (unnecessary, able to use, and necessary). The interview results of theme that already selected the evaluation test about form and physical fitness of disabled athletes participating in wheelchair racing in Ho Chi Minh are:

- Form: 15 criteria
- Physical fitness: 13 criteria

Checking the reliability and notification properties

- Checking the reliability

To check the reliability of the test, I conducted testing on 20 disabled athletes participating in wheelchair racing. They are tested in 2 times, the time between two tests is separated 5 days with the same conditions. After that, we carried out correlation coefficient (r) counting of some criteria and collected the results, as shown in Table 1.

- If the correlation coefficient $r > 0.8$; $P < 0.05$, the test will be accepted in terms of reliability
- If the correlation coefficient $r < 0.0$, the test will not be accepted in terms of reliability
  Basing on Table 1, all the test criteria also have $r > 0.8$ and $P < 0.05$, so the above table is reliable for appraising the physical fitness of study objects.
  We did not conduct checking the reliability of evaluation criteria for athletes' form because the index of form is not changed much and measured by modern equipment with high precision.
- Checking the notification properties
  To check the notification properties of the study criteria, the theme is conducted counting correlation coefficient between the performance of test criteria and the competition ranking result using Spearmen's rank correlation coefficient. The results are shown in Table 2.

The results of Table 2 show that there are some criteria express the correlation with competition performance ($r > 0.4$). Those criteria have enough notification properties and availabilities to evaluate the form and physical fitness of disabled athletes (male) participating in wheelchair racing in Ho Chi Minh City. These criteria show the weak correlation with competition performance ($r < 0.4$), do not reach the notification properties, so this test is not selected to apply to the study.

Through three steps of collecting documents, interviewing, and checking the reliability and notification properties, the theme has determined evaluation criteria for form and physical fitness of disabled athletes (male) participating in wheelchair racing in Ho Chi Minh City including:

- **Form:** Hand length (cm), hand width (cm), arm shrinking' size (cm), size of chest taking deep breath (cm), and average size of chest (cm).
- **Physical fitness:** Squeeze force of dominant hand (KG), squeeze force of non-dominant hand (KG), hand movement speed in 20 s (time), rolling wheelchairs for 30 m with high speed (second), rolling wheelchairs for 100 m (second), rolling wheelchairs for 400 m (second), rolling wheelchairs for 800 m (second), rolling wheelchairs for 1500 m (second), and rolling wheelchairs for 3000 m (second).

Current form and Physical Fitness of Disabled Athletes (Male) Participating in Wheelchair Racing in Ho Chi Minh City

To evaluate the current situation for form and physical fitness of disabled athletes (male) participating in wheelchair racing

Table 1: The reliability coefficient of criteria for evaluating disabled athletes participating in wheelchair racing in Ho Chi Minh City

Factors, criteria		First time $\bar{X}$± S	Second time $\bar{X}$± S	*r*	*P*
Physical fitness	Squeeze force of dominant hand (KG)	43.57±4.00	43.40±4.13	0.98	<0.05
	Squeeze force of non-dominant hand (KG)	42.38±4.08	42.57±3.74	0.98	<0.05
	Pulling up (time)	11.00±3.14	10.77±2.88	0.93	<0.05
	Lay up and do crunches in 30 s (time)	15.30±4.34	15.37±4.44	0.95	<0.05
	Throw ball 2 kg (m)	6.70±1.32	6.83±1.24	0.93	<0.05
	Throw ball to the goal (time)	11.66±2.01	11.64±1.90	0.98	<0.05
	Hand movement speed in 20 s (time)	48.37±3.85	48.27±4.20	0.95	<0.05
	Roll the wheelchair for 30 m with high speed (second)	3.65±0.25	3.60±0.23	0.93	<0.05
	Roll the wheelchair for 100 m (second)	21.67±1.76	21.45±1.77	0.90	<0.05
	Roll the wheelchair for 400 m (second)	86.30±5.65	86.38±5.68	0.99	<0.05
	Roll the wheelchair for 800 m (second)	147.78±13.44	146.71±12.72	0.98	<0.05
	Roll the wheelchair for 1.500 m (second)	284.06±26.57	279.55±26.13	0.96	<0.05
	Roll the wheelchair for 3.000 m (second)	807.11±79.91	820.61±79.95	0.97	<0.05

Table 2: The rank correlation coefficient between form and physical evaluation criteria of wheelchair disabled athletes in Ho Chi Minh City

Factors, criteria		*r*	*P*
Form	Height sitting (cm)	0.32	>0.05
	Weight (kg)	0.24	>0.05
	Arm's length (cm)	0.18	>0.05
	Arm span' length (cm)	0.25	>0.05
	Hand length(cm)	0.46	<0.05
	Hand width (cm)	0.42	<0.05
	Shoulder width (cm)	0.15	>0.05
	Pelvis width (cm)	0.21	>0.05
	Hip width (cm)	0.24	>0.05
	Wrist size (cm)	0.23	>0.05
	Arm shrinking size (cm)	0.41	<0.05
	Arm stretching size (cm)	0.12	>0.05
	Size of chest taking deep breath (cm)	0.43	<0.05
	Size of chest taking deep sigh (cm)	0.33	>0.05
	Average size of chest (cm)	0.41	<0.05
Physical fitness	Squeeze force of dominant hand (KG)	0.66	<0.05
	Squeeze force of non-dominant hand (KG)	0.62	<0.05
	Pulling up (time)	0.34	<0.05
	Lay up and do crunches in 30 s (times)	0.35	<0.05
	Throw ball 2 kg (m)	0.35	<0.05
	Throw ball to the goal (times)	0.27	<0.05
	Hand movement speed in 20 s (time)	0.72	<0.05
	Roll the wheelchair for 30 m with high speed (second)	0.68	<0.05
	Roll the wheelchair for 100 m (second)	0.71	<0.05
	Roll the wheelchair for 400 m (second)	0.7	<0.05
	Roll the wheelchair for 800 m (second)	0.75	<0.05
	Roll the wheelchair for 1.500 m (second)	0.72	<0.05
	Roll the wheelchair for 3.000 m (second)	0.74	<0.05

in Ho Chi Minh City, we started to check the evaluation criteria for form and physical fitness which is specified in 2.1, counted by basis statistical parameters such as: Average value ($\bar{X}$), standard deviation (S), Coefficient variation (Cv%), and relative error(ε). All of them are shown in Tables 3 and 4.

As it is shown in Table 3, the variation coefficient reflects the variation of parameter fluctuating among individuals existed in sample set, population at the evaluation criteria for form of disabled athletes in Ho Chi Minh City is hand length, hand width, and average size of chest which have the coefficient

Table 3: Collecting performance of evaluation criteria for form of disabled athletes (male) participating in wheelchair racing in Ho Chi Minh City

TT	Criteria	$\bar{X}$	S	Cv	ε
1	Hand length (cm)	18.80	1.49	7.94	0.03
2	Hand width (cm)	9.30	0.86	9.27	0.03
3	Arm shrinking size (cm)	32.50	3.52	10.83	0.04
4	Size of chest taking deep breath (cm)	87.43	12.83	14.68	0.05
5	Average size of chest (cm)	87.40	4.44	5.08	0.02

Table 4: Collecting performance of evaluation criteria for physical fitness of disabled athletes (male) participating in wheelchair racing in Ho Chi Minh City

TT	Criteria	$\bar{X}$	S	Cv	ε
1	Squeeze force of dominant hand (KG)	43.57	4.00	9.19	0.03
2	Squeeze force of non-dominant hand (KG)	42.38	4.08	9.64	0.04
3	Hand movement speed in 20 s (time)	48.37	3.85	7.96	0.03
4	Rolling the wheelchairs for 30 m with high speed.	3.65	0.25	6.83	0.03
5	Rolling the wheelchairs for 100 m (second)	21.67	1.76	8.12	0.03
6	Rolling the wheelchairs for 400 m (second)	86.30	5.65	6.54	0.02
7	Rolling the wheelchairs for 800 m (second)	147.78	13.44	9.09	0.03
8	Rolling the wheelchairs for 1.500 m (second)	284.06	26.57	9.35	0.03
9	Rolling the wheelchairs for 3.000 m (second)	807.11	79.91	9.90	0.04

variation Cv < 10%, so the uniformity of the above criteria is high (synonymous with small dispersion). In the criteria of arm shrinking size and size of chest taking deep breath have the variation coefficient 20% > Cv>10%, so the above criteria have the average uniformity. However, all the parameter reflects the relative error of sample mean, the data have shown that all the sample mean are sufficiently representative (ε) < 0.05.

The above analysis shows that the current form of study object is the same and representative for all the disabled athletes (male) participating in wheelchair racing in Ho Chi Minh City.

As it is shown in Table 4, the variation coefficient reflects the variation of parameter fluctuating among individuals existed in sample set, population at the evaluation criteria for physical

fitness of disabled athletes in Ho Chi Minh which have the coefficient variation Cv < 10%, so the uniformity of the above criteria is high (synonymous with small dispersion). The parameter (ε) reflects the relative errors of sample mean and the data have shown that all the sample mean are sufficiently representative (ε) < 0.05.

The above analysis shows that the current physical fitness of study object is the same and representative of all the disabled athletes (male) participating in wheelchair racing in Ho Chi Minh City.

CONCLUSION

The evaluation criteria for form and physical fitness of disabled athletes (male) participating in wheelchair racing in Ho Chi Minh through collecting documents, interviewing, checking reliability, and notification properties include:

- **Form:** Hand length (cm), hand width (cm), arm shrinking size (cm), size of chest taking deep breath (cm), and average size of chest (cm).
- **Physical fitness:** Squeeze force of dominant hand (KG), squeeze force of non-dominant hand (KG), hand movement speed in 20 s (times), roll the wheelchairs for 30 m with high speed (second), roll the wheelchairs for 100 m (second), roll the wheelchairs for 400 m (second), roll the wheelchairs for 800 m (second), roll the wheelchairs for 1500 m (second), and roll the wheelchairs for 3000 m (second).

The current situation of form and physical fitness of disabled athletes (male) participating in wheelchairs racing is good and equal, can be representative for all the male disabled wheelchairs athletes racing in Ho Chi Minh City.

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Research Article

The research of physical evaluation criteria of 14-year-old male athletes in Hoang Anh Gia Lai JMG Football Academy

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ABSTRACT

By doing routine research methods, the theme conducted three steps. The findings showed 11 criteria which have enough reliability, thereby providing information on physical health condition to evaluate the physical fitness of 14-year-old male athletes in Hoang Anh Gia Lai JMG Football Academy.

Keywords: Criteria, Physical, Hoang Anh Gia Lai JMG Football Academy

RATIONALE

Competition for sporting achievement is a race of human exercise capacity, in which the ability of human exercise is affected by many factors such as physiology, exercise control and biomechanics, sport technology, anthropometry, mentality, and achievement analysis. Basing on those factors, the human body is a very necessary part which plays an important role in an athlete's success in modern sport. It is required to evaluate rightly the athlete body to apply proper exercises. Therefore, it is very in need to appraise the athlete's body. One of the very important parts of deciding the success is listing the evaluation criteria in a scientific way which is exact and proper for the current situation as well as psychophysiological characteristics, age, and body of athletes. With the exact evaluation criteria, the trainers will apply suitable exercises to athletes to help them train and develop their body. For that reason, I choose the topic of the research which is "*The research of physical evaluation criteria of 14-year-old male athletes in Hoang Anh Gia Lai JMG football academy*"

Research methods: There are five methods that can serve my study, particularly analytic-synthetic, interview, pedagogical test, medical test, and mathematical statistics.
Number of study object: Fourteen athletes at the age of 14 studying in Hoang Anh Gia Lai JMG Football Academy.
Objects of the interview: Eighteen persons including officials, experts, and coaches.

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Study Result and Discussion

Summary of physical evaluation criteria for football players of domestic and foreign authors

There are three steps to determine the evaluation criteria for athletes at the age of 14 in Hoang Anh Gia Lai JMG Football Academy.

Step 1: Summarizing the physical evaluation criteria of athletes based on available documents and research works from domestic and foreign authors.
Step 2: Interviewing trainers, experts, and specialists
Step 3: Checking the reliability of criteria

Summarizing the physical evaluation criteria of athletes based on available documents and research works from domestic and foreign authors.

By having a reference on documents about Vietnamese physical survey of Institute of Science exercise and sports, regulation of physical evaluation criteria for students of Ministry of Education and Training, according to Duong Nghiep Chi and his partner (2004), Pham Ngoc Vien and his partner (2004), Bui Quang Hai and his partners (2009), Pham Xuan Thanh (2007), Duong Nghiep Chi – Tran Quoc Tuan (2004), Tran Quoc Tuan – Nguyen Minh Ngoc (2002), Nguyen Thiet Tinh (1997), Nguyen The Truyen – Nguyen Kim Minh – Tran Quoc Tuan (2002),… and based on characteristics of research objects as well as consulting officials' advices, I decide to choose 25 proper criteria, including six evaluation criteria for the human

form, seven evaluation criteria for function, and 12 evaluation criteria for physical fitness.

Interviewing to make a selection of evaluation criteria for 14-year-old male athletes in Hoang Anh Gia Lai JMG Football Academy

According to the result of selecting criteria in step 1, topics to form interview questionnaires, interviews conducted 2 times or apart 1 month to ensure the liability of objects interviewed by interview questionnaires will be given to 18 trainers, experts, and specialists who have experience in training football players in training centers such as Gia Lai, Phu Yen, Khanh Hoa, Da Nang, Binh Duong, and Ho Chi Minh city.

The questionnaires are used for doing research and making a selection of necessary criteria to evaluate research objects. People who took the questionnaires will be allowed to choose 1 of 3 options and they are counted as follows: Three points for frequently use, two points for rarely use, and 0 point for never use.

The interview results in Table 1 shown that all the criteria through 2 times interviewing have $\chi^2_{tính} < \chi^2_{bảng} = 3.84$, so the difference between 2 interviews has no meaning at probability threshold $P > 0.05$. Hence, the results of 2 times interviewing experts, coaches are identical. Therefore, the results of selecting criteria with overall interview score ≥75% in two interviews included in the study:

Form: Height (cm), Quetelet (g/cm), and bone age test

Function: Cardiac Function (HW), VO2 Max(ml/kg/min), and live capacity (l)

Table 1: Interview result of selecting physical evaluation criteria for 14-year-old male athletes in Hoang Anh Gia Lai JMG Football Academy. After checking the difference between two interviews when using the square formula (x^2), the results are shown in Table 1

Criteria		First turn (n=18)		Second turn (n=18)		x^2	P
		∑ *diem*	Percentage	∑ *diem*	Percentage		
Physical Fitness	XPC running 10 m (s)	40	74.07	40	74.07	0.00	>0.05
	XPC running 15 m (s)	39	72.22	39	72.22	0.00	>0.05
	XPC running 30 m (s)	51	94.44	51	94.44	0.00	>0.05
	Run 5×30 m (s)	40	74.07	40	74.07	0.00	>0.05
	Run 10×30 m (s)	40	74.07	40	74.07	0.00	>0.05
	Standing long jump (cm)	52	96.30	52	96.30	0.00	>0.05
	Standing high jump (cm)	39	72.22	39	72.22	0.00	>0.05
	Test Cooper (m)	54	100.00	54	100.00	0.00	>0.05
	Run 2000 m (s)	39	72.22	39	72.22	0.00	>0.05
	T test (s)	39	72.22	39	72.22	0.00	>0.05
	Running around the 5 meter stake (s)	48	88.89	48	88.89	0.00	>0.05
	Standing up and sitting down (cm)	54	100.00	54	100.00	0.00	>0.05
Physiological function	Quiet heartbeat (l/min)	40	74.07	40	74.07	0.00	>0.05
	Cardiac function(HW)	53	98.15	53	98.15	0.00	>0.05
	Blood pressure (mmHg)	40	74.07	40	74.07	0.00	>0.05
	VO2 Max (ml/kg/min)	54	100.00	54	100.00	0.00	>0.05
	Live capacity (l)	53	98.15	53	98.15	0.00	>0.05
	Anaerobic capacity ACP (w/kg)	40	74.07	40	74.07	0.00	>0.05
	Maximum anaerobic capacity RPP (w/kg)	40	74.07	40	74.07	0.00	>0.05
Form	Height (cm)	46	85.19	46	85.19	0.00	>0.05
	Weight (kg)	40	74.07	40	74.07	0.00	>0.05
	BMI (kg/m^2)	39	72.22	39	72.22	0.00	>0.05
	Quetelet (g/cm)	45	83.33	45	83.33	0.00	>0.05
	Physical structure somatotype	39	72.22	39	72.22	0.00	>0.05
	Bone age test	48	88.89	48	88.89	0.00	>0.05

Physical fitness: XPC running 30 m(s), standing long jump (cm), Test Cooper (m), running around the 5-m stake, and standing up and sitting down.

Determining the Liability of Criteria

We did not conduct testing the reliability with evaluation criteria of form and physiological function because those are counted by modern equipment with high accuracy. Therefore, we only carry out testing the liability for the physical evaluation criteria of research objects.

To determine the reliability of selected criteria, we used the retest method to identify correlation coefficient between two tests on 14 male athletes at the age of 14 in Hoang Anh Gia Lai JMG academy. The time between two tests is separated by 5 days, sequential tests, conditions for testing, and the break time between two tests and the procedures are equally assured. By applying the correlation coefficient formula of Pearson, the result is shown on Table 2.

It is showed that all five evaluation criteria have the same correlation coefficient $r > 0.8$, at $P < 0.01$. Hence, the five evaluation criteria above can assure the reliability in the purpose of appraising the physical fitness of male athletes at the 14 in Hoang Anh Gia Lai JMG Academy.

Through steps of collecting documents, interviewing, as well as checking the reliability, the theme has chosen the evaluation criteria on physical fitness of male athletes at the age of 14 in Hoang Anh Gia Lai JMG Academy including:

Form: Height (cm), Quetelet (g/cm), and bone age test.
Function: Cardiac function (HW), VO2 Max(ml/kg/min), and live capacity (liter)
Physical fitness: XPC running for 30 m (s), standing long jump (cm), test Cooper (m), Zigzag running (5 stakes) for 5 m, and standing up and sitting down (cm)

Evaluating the Current Physical Fitness of Male Athletes at the age of 14 in Hoang Anh Gia Lai JMG Football Academy

To evaluate the current physical fitness of male athletes at the age of 14 in Hoang Anh Gia Lai JMG Football Academy based on the data collected, we conducted counting statistic parameters such as mean ($\bar{X}$), standard deviation (S), coefficient of variation (Cv%), and relative error (ε), the results are shown in Table 3.

Table 3 is shown.

About the bone age of male athletes at the age of 14 in Hoang Anh Gia Lai JMG Football Academy, their average bone age is 13.72, which nearly has the same average age of birth

Table 2: The reliability coefficient of evaluation criteria of male athletes at the age of 14 in Hoang Anh Gia Lai JMG Academy (n=14)

TT	Criteria	First turn ($\bar{X}\pm S$)	Second turn ($\bar{X}\pm S$)	r	P
1	XPC running 30m (s)	4.16±0.28	4.18±0.25	0.98	<0.01
2	Standing long jump (cm)	227.50±11.41	226.64±12.06	0.96	<0.01
3	Test Cooper (m)	2658.79±76.65	2653.00±73.65	0.99	<0.01
4	Zigzag running (5 stakes) for 5 m	15.89±0.40	15.89±0.43	0.98	<0.01
5	Standing up and sitting down (cm)	18.93±1.44	18.64±1.28	0.91	<0.01

Table 3: Current physical fitness of male athletes at the age of 14 in Hoang Anh Gia Lai JMG Football Academy (n=14)

Criteria		$\bar{X}$	S	Cv	ε
Physical fitness	XPC running for 30 m (s)	4.16	0.28	6.68	0.04
	Standing long jump (cm)	227.50	11.41	5.02	0.03
	Test Cooper (m)	2658.79	76.65	2.88	0.02
	Zigzag running (5 stakes) for 5 m (s)	15.89	0.40	2.54	0.02
	Standing up and sitting down	18.93	1.44	7.60	0.05
Function	Cardio Function (HW)	8.03	1.76	21.89	0.14
	VO2 Max (ml/kg/min)	48.14	1.71	3.56	0.02
	Live capacity (l)	3.30	0.24	7.23	0.05
Form	Height (cm)	160.93	8.19	5.09	0.03
	Quetelet (g/cm)	296.34	31.43	10.61	0.07
	Age of birth	13.68	0.28	2.06	0.01
	Bone age test	13.72	0.32	2.33	0.01

13.68. The above results show that the study objects have body development which is equivalent to the biological law of the human body.

The average VO_2 Max (ml/kg/min) coefficient of male athletes at the age of 14 in Hoang Anh Gia Lai JMG Football Academy is 8.3 ranked as average level, according to Ruffier's HW ability classification.

According to Le Quy Phuong, Dang Quoc Bao (2002), the average live capacity of male athletes at the age of 14 in Hoang Anh Gia Lai JMG Academy is 3.3 (l) (normally showed 3–4 L in the male).

The average index of the Cooper test of 14-year-old male athlete in Hoang Anh Gia Lai JMG Academy is 2658.79m, ranked as good according to classification table of exercise capacity based on the result of 12 min running (test Cooper) of a male under 30 years old.

The average Quetelet index (g/cm) of 14-year-old male athlete in Hoang Anh Gia Lai JMG Football Academy is 296.34 g/cm lower than the average index for male (average Quetelet is normally showed around 370–400 g/cm for male). It is said that the index quetelet indicates how much an average 1 cm weight is that the above result showed that 14-year-old male athletes in Hoang Anh Gia Lai JMG Football Academy have the weight which is not proportional with the height or has the weight developing less than the height.

CONCLUSION

The study has shown:

- Finishing determining 11 reliable criteria for evaluating physical fitness of 14-year-old male athletes in Hoang Anh Gia Lai JMG Football Academy:
  - Form: Height (cm), Quetelet (g/cm), and bone age test
  - Function: Cardio function (HW), VO2 Max (ml/kg/min), and live capacity (liter)
  - Physical fitness: XPC Running 30m (s), standing long jump (cm), and test Cooper (m)
- Current physical fitness of 14-year-old male athletes in Hoang Anh Gia Lai JMG Football Academy has the height developing as the biological regulation of the human body; weight is not proportional with the height, good function, and good endurance.

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Research Article

Researching amount of exercise in some tasks for developing the endurance of male cycling athletes from 16 to 18 years old in Ho Chi Minh city

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ABSTRACT

Cycling is one of the sports requiring endurance from the athletes for a long time from 30 min to h, to overcome many kilometers with the fastest time. Basing on the result of research on the amount of exercise inside the tasks which develop the endurance measured on 16–18 years-old athletes for male cycling in Ho Chi Minh city, We present some characteristics of endurance for male road bicycle racing.

Keywords: Amount of exercise, Endurance, Ho Chi Minh city, Road bicycle racing, Tasks

RATIONALE

Endurance can be defined as the ability to continue to endure stress, hardship, or level of suffering. In the context of sport, endurance is the ability to sustain a specific activity for a prolonged period of time. Road bicycle racing requires athletes to have a high amount of endurance. With a long-distance of 10 km, if the athletes' endurance is not good, they will finish racing slowly and cannot carry out the sprint before ending the race. From a biomedical perspective, scientists have based on the energy ability supplied by anaerobic and aerobic of athletes to classify anaerobic, aerobic endurance, or mixture of anaerobic-aerobic endurance.

Therefore, in terms of sports physiology, the endurance in cycling is the endurance mixture of anaerobic and aerobic. Basing on the biomedical basis, we would like to analyze the result of testing road bicycle racing athletes through the all-out test in laboratory and cycling tasks on the road.

Study object: Thirty-four talented athletes from 16 to 18 years old in Ho Chi Minh City.

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Study Methods and Data Collecting

***Study method*:** collecting documents, interviewing, medical testing, and mathematical statistics.

***Research design*:** Descriptive intervention study using biomedical test for cyclists.

***Type of research*:** quantitative and analytical

***Research tools*:** In the physiology laboratory of the institute of sport science, we use the dynamometer-bicycle, Italia's Cosmed diagnostic equipment for physiological function, Polar circuit monitoring watch, and smartwatch to do the all-out test.

Data collecting skills:

Using test of running by every effort and parameter measurement during 40 km cycling exercise to get the biomedical test results, the physiological parameter provided by Cosmed included in the study:

+ VO_2 max (ml/min): Maximum oxygen uptake.
+ VO_2 max (ml/min/Kg): Relative oxygen uptake.
+ % VO_2 max(% VO_2 max Values@LT): The proportion of Oxygen uptake at the time of anaerobic threshold.
+ VT (tidal volume): Tidal volume
+ VE (Exhaled ventilation): Exhaled ventilation (l/min)
+ HR (Heart rate) : Heart rate (ck/min)

+ VO_2/HR (O_2 pulse): Oxygen – pulse coefficient is the volume of oxygen supplied from each pulse (systolic).

RESULTS AND DISCUSSION

Evaluation on Aerobic Endurance of Road Cycling Racing Athletes from 16 to 18 Years Old through the All-Out Test In The Laboratory

In the human body, the energy supply source from the oxidation reaction of organic substances plays an important role in supplying aerobic energy, in which the maximum volume of oxygen uptake (VO_2 max) is the specific coefficient in terms of evaluating the aerobic endurance of every single person.

On the other hand, VO_2 max depends on the oxygen transport function of respiratory system and cardiovascular. Therefore, to evaluate the aerobic endurance by the all-out running method in laboratory (n = 34 athletes), we usually use the coefficient of oxygen transport function of respiratory system and cardiovascular and VO_2 max coefficient of cyclists from 16 to 18 years old.

As Table 1 is shown:

- VO_2 max (maximum) is 2758 ± 289 ml/min
- VO_2 max (relative) is 53.2 ± 2.6 ml/min/kg
- Volume tidal VT max is 2.06± 0.14 l
- Exhaled ventilation VE max is 123 ± 8.2 l/min
- Heart rate HR max is 189 ± 6.4 times/min

Having reference to the world classification: Male athletes under the age of 17 belong to group A which includes endurance subjects, and they are classified as average physical fitness if VO_2 max (relative) is from 53 to 61 ml/min/kg. Hence, evaluating the coefficient of maximum oxygen uptake per body weight (VO_2 max relative), the aerobic endurance of study objects can be equivalent to the world's athletes.

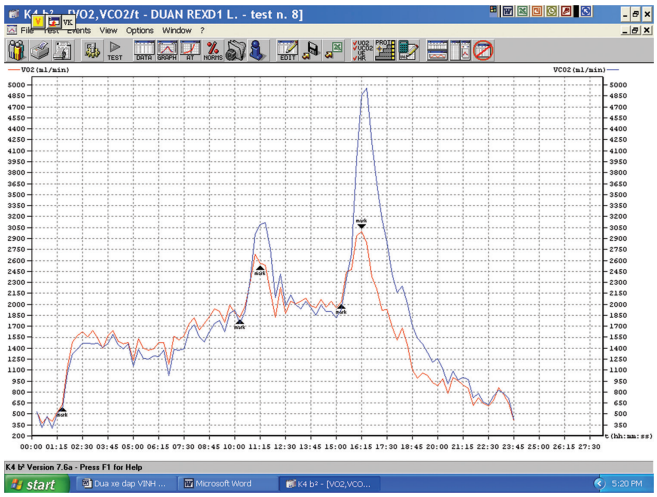
The coefficient if oxygen transport function of the respiratory system and cardiovascular is also at a high level. The VE is 123l/min. The VO_2 /HR is at an average of 17.6 ml/pulse, while normally, the maximum coefficient of VO_2/HR is 12ml/pulse.

Evaluating the endurance of cycling athletes from 16 to 18 years old through the attack test on-road racing

In this study, we present the changes happening while we conduct the attack tasks of Le Van Duan (an athlete). The exercises will be last for 15 min. The exercise period will be divided into four periods:

- Period 1: Cycling for 9 min with a speed of 40–45 km/h
- Period 2: Speeding up, passing the competitors for 1 min.
- Period 3: Maintaining the speed around 50–55 km/h
- Period 4: Finishing the race with the highest speed (sprint).

We can see the physiological changes shown through the Cosmed measurement method. The report which is shown in picture 1 is the chart of monitoring changes VO_2 CO_2 and Table 2.



- Phase time: Time of carrying out the test following each period
- VE: Exhaled ventilation. Counted as a unit of liter/minute (l/min)
- VO_2 : Volume of maximum oxygen uptake. Counted as a unit of ml/min
- VCO_2: Volume of carbon dioxide breathe out. Counted as unit of ml/min
- R: Respiratory quotient: R = VCO_2/VO_2
- HR: Heart rate. Counted as unit time/minute (l/min)
- VO_2/HR: Oxygen coefficient/pulse

Table 1: The evaluation coefficient for aerobic endurance of male road cycling racing from 16 to 18 years old in Ho Chi Minh city

Value (*n*=34)	Transport function		Respiratory function		Cardiovascular function	
	VO_2 max ml/min	VO_2 max ml/min/Kg	VT max liter	VE max l/min	HR max l/min	VO_2/HR max ml/min
Max	2994	56.1	2.23	137	201	20.9
Min	2501	47.5	1.87	115	185	15.7
X	2758	53.2	2.06	123	189	17.6
∂	289	2.6	0.14	8.2	6.4	1.7

Table 2: The changes of physiological parameter of Le Van Duan (an athlete) during practicing the attack tasks continuously in 15 min

Period Speed from 40–45 km/h	Phase time mm:ss	Rf b/min	VT l	VE l/min	VO_2 ml/min	VCO_2 ml/min	VO_2/Kg ml/min/Kg	R ---	HR bpm	VO_2/HR ml/bpm	EEm Kcal/min
	00:00	28	0.70	19	627	562	9.8	0.9	101	6.20	3.07
	00:15	29	1.10	32	1138	1060	17.8	0.9	120	9.48	5.63
	00:30	28	1.35	38	1487	1320	23.2	0.9	122	12.19	7.28
	00:45	28	1.45	41	1576	1389	24.6	0.9	122	12.92	7.71
	01:00	32	1.36	44	1628	1467	25.4	0.9	122	13.35	8.00
	01:15	30	1.42	42	1557	1467	24.3	0.9	121	12.87	7.73
	01:30	32	1.34	42	1645	1463	25.7	0.9	117	14.06	8.06
	01:45	32	1.38	44	1537	1471	24.0	1.0	116	13.25	7.66
	02:00	29	1.41	41	1398	1405	21.8	1.0	123	11.37	7.05
	02:15	31	1.40	43	1575	1471	24.6	0.9	122	12.91	7.81
	02:30	32	1.48	48	1642	1590	25.7	1.0	120	13.68	8.21
	02:45	34	1.31	44	1499	1452	23.4	1.0	121	12.39	7.49
	03:00	32	1.33	42	1461	1391	22.8	1.0	122	11.98	7.27
	03:15	28	1.54	43	1474	1458	23.0	1.0	121	12.18	7.41
	03:30	30	1.15	35	1233	1161	19.3	0.9	120	10.27	6.12
	03:45	27	1.50	40	1531	1386	23.9	0.9	118	12.98	7.53
	04:00	30	1.22	37	1398	1264	21.8	0.9	118	11.85	6.88
	04:15	32	1.16	37	1378	1250	21.5	0.9	118	11.68	6.78
	04:30	30	1.28	39	1391	1295	21.7	0.9	121	11.50	6.89
	04:45	31	1.23	38	1473	1287	23.0	0.9	122	12.08	7.19
	05:00	33	1.25	41	1475	1371	23.0	0.9	122	12.09	7.30
	05:15	31	0.99	31	1182	1027	18.5	0.9	121	9.77	5.76
	05:30	30	1.32	40	1567	1382	24.5	0.9	127	12.34	7.67
	05:45	34	1.16	40	1516	1373	23.7	0.9	128	11.84	7.46
	06:00	34	1.19	40	1570	1389	24.5	0.9	134	11.72	7.69
	06:15	35	1.36	48	1741	1641	27.2	0.9	136	12.80	8.65
	06:30	33	1.55	51	1812	1722	28.3	1.0	133	13.63	9.02
	06:45	33	1.42	47	1655	1558	25.9	0.9	130	12.73	8.22
	07:00	34	1.27	43	1736	1491	27.1	0.9	134	12.95	8.44
	07:15	33	1.41	47	1830	1623	28.6	0.9	136	13.45	8.96
	07:30	34	1.49	51	1940	1736	30.3	0.9	142	13.66	9.52
	07:45	37	1.42	52	1906	1781	29.8	0.9	146	13.06	9.45
	08:00	33	1.38	46	1754	1631	27.4	0.9	144	12.18	8.68
	08:15	40	1.44	57	1990	1877	31.1	0.9	146	13.63	9.89
	08:30	35	1.63	57	1887	1918	29.5	1.0	145	13.01	9.55
	08:45	38	1.32	51	1822	1738	28.5	1.0	142	12.83	9.08
	09:00	38	1.49	57	1959	1899	30.6	1.0	147	13.33	9.80
Breakthrough	09:15	54	1.37	74	2296	2309	35.9	1.0	161	14.26	11.59
	09:30	40	1.90	77	2689	2964	42.0	1.1	169	15.91	13.90
	09:45	40	1.97	78	2564	3092	40.1	1.2	157	16.33	13.58
	10:00	42	2.01	85	2537	3114	39.6	1.2	154	16.48	13.51
	10:15	43	1.89	81	2185	2764	34.1	1.3	148	14.76	11.73

(Contd...)

Table 2: ***(Continued)***

Period Speed from 40–45 km/h	Phase time mm:ss	Rf b/min	VT l	VE l/min	VO_2 ml/min	VCO_2 ml/min	VO_2/Kg ml/min/Kg	R ---	HR bpm	VO_2/HR ml/bpm	EEm Kcal/min
Maintaining high speed	10:30	34	1.77	61	1823	2090	28.5	1.1	145	12.57	9.52
	10:45	41	1.76	72	2230	2414	34.8	1.1	148	15.06	11.47
	11:00	35	1.69	59	1874	1984	29.3	1.1	146	12.84	9.58
	11:15	36	1.76	64	2044	2126	31.9	1.0	148	13.81	10.40
	11:30	40	1.55	61	2003	1996	31.3	1.0	143	14.01	10.09
	11:45	34	1.70	59	2043	1936	31.9	0.9	144	14.19	10.16
	12:00	35	1.77	63	2086	2039	32.6	1.0	147	14.19	10.46
	12:15	38	1.64	63	1985	1955	31.0	1.0	151	13.14	9.97
	12:30	37	1.54	57	1954	1848	30.5	0.9	152	12.85	9.71
	12:45	41	1.55	64	2068	1993	32.3	1.0	155	13.34	10.33
	13:00	36	1.63	59	1965	1898	30.7	1.0	151	13.01	9.82
	13:15	36	1.64	59	2041	1903	31.9	0.9	149	13.69	10.11
	13:30	35	1.61	57	1950	1814	30.5	0.9	152	12.83	9.66
	13:45	40	1.51	61	2032	1927	31.7	0.9	158	12.86	10.11
	14:00	44	1.70	74	2443	2357	38.2	1.0	169	14.45	12.21
Sprint to the finish line	14:15	63	1.47	93	2473	2695	38.6	1.1	177	13.97	12.74
	14:30	77	1.67	129	2935	3978	45.9	1.4	182	16.13	16.09
	14:45	57	2.12	121	2999	4864	46.9	1.6	185	16.21	17.44
	15:00	54	2.35	128	2839	4954	44.4	1.7	180	15.77	16.94
	15:15	50	2.37	118	2378	4225	37.2	1.8	173	13.75	14.28

The results are shown in Table 2:

- Period 1: With speed of 40–45 km/h, from 0:15 to 9:00 minutes, R < 1, it means that energy supplied to athlete mainly from aerobic energy. The functional-coefficient, such as VT, VE, HR, and VO_2/HR, is in the zone of aerobic energy conversion. The highest heart rate is 147 times/min (HR=147 b/min)
- Period 2: In 1 min, speeding up and passing the competitor, R > 1 (R = 1.3), it means that the energy supplied to the athlete in the purpose of speeding up to pass the competitor is from anaerobic energy. Exceeding 130% of the energy source for athletes in period 1. However, the highest heart rate in this period is only up to 168 l/min (HR = 168b/min), speed reach in the range of 75–80km/h.
- Period 3: Speed is round 50–55 km/h, maintaining in 4 minutes, R < 1, it means that energy supplied to the athlete is mainly from aerobic energy.

Period 4: In 1 min to the finish line, speeding up with the highest speed, R is up to 1.8. It means that the anaerobic energy is increased significantly, exceeding 180% compared to the time carrying out the sprint. The functional-coefficient, such as VT, VE, HR, and VO_2/HR, is in the zone of aerobic energy conversion. The highest heart rate in this period is up to 185 times/min (HR=185b/min). The volume of CO_2 is up to 4954ml/min (before carrying out the sprint), the highest speed is 106km/h.

In road bicycle racing, the ability of supplying aerobic energy during the race is called aerobic endurance or endurance. However, when it comes to the specialty, the cyclists not only have the aerobic endurance but also the potentiality of anaerobic to perform some skills such as speed breakthrough (attack) or conduct the sprint before getting to the finish line. Therefore, when doing exercise, the athletes have to do exercises to develop the endurance as well as practice specialized tasks to enhance aerobic ability.

CONCLUSION

1. The demand for supplying energy to cyclists by aerobic conversion is expressed through the coefficient of maximum oxygen uptake per body weight (VO_2 max relative) of study objects which are equivalent to the coefficient of world' athletes. VO_2 max value is from 47.5 – 56.1 ml/min/kg.

   The coefficient if oxygen transport function of the respiratory system and cardiovascular is also at high level. The VE is 123 l/min. The VO_2 /HR is at an average of 17.6 ml/pulse, while normally, the maximum coefficient of VO_2/HR is 12 ml/pulse.
2. Anaerobic digestion capacity increases to meet the energy for the speed phase or carry out the sprint before finishing

the line, exceeding 180% compared to the time carrying out the sprint. In 1 min of carrying out the sprint, the function of respiratory and circulation takes action in the zone of aerobic energy conversion. The highest heart rate in this period is up to 185 times/min (HR=185b/min). The volume of CO_2 is up to 4954 ml/min.

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Research Article

Setting current evaluation criteria for boarding students in Ho Chi Minh University of physical education and sports

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ABSTRACT

Through the steps of summarizing documents, interviewing experts, experts, building questionnaire, determining the form of an answer, and testing the reliability of the questionnaire through Cronbach's alpha index. The paper has identified a scale to assess the situation of lifestyle for boarding students at the Ho Chi Minh City University of Pedagogy and Sports, including 73 items: Learning sticky (20 questions), routine (22 questions), communication (21 questions), and love life (10 questions).

Keywords: Boarding student, Lifestyle, Physical education and sports

RATIONALE

Nowadays, market mechanism and international integration have contributed significantly to human life; however, they also have positive impacts on awareness, morality, and students' life. The lifestyle of enjoying from abroad has influenced and might change our normal life. Many students still be doubtful and confused about ideals; they tend to like foreign things, have no respect for the national cultural values, and just follow to the lifestyle ideals of pragmatism, selfishness which affect seriously the fine customs of the nation. Students of Ho Chi Minh University of physical education and sports are very energetic, creative, talkative, and enthusiastic, but they also lack of life experience, they are easily influenced that lead to change their ideal lifestyle.

It is said that every social-economic morphology has a typical lifestyle; every single career is different. Therefore, what is the lifestyle of students in the university of physical education and sports? Is that lifestyle proper to the society in the future? To get the exact and complete information about students' lifestyle, we need to have scientific evaluation criteria. Thereby, I conducted a research on "Building the evaluation criteria of the current lifestyle of boarding students in Ho Chi Minh University of Physical Education and Sports.

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Study Methods

There are three methods that we use to do the research: Method of referencing, interviewing, and mathematical statistics.

Study Object

1. A total of 396 boarding students in Ho Chi Minh University of Physical Education and Sport.
2. Managers of boarding area, two specialists, and two teachers.

STUDY RESULTS AND DISCUSSION

The ways of living are stable aspects of life; ways of living are shown in human's action. Therefore, the lifestyle is in a very spacious range and it is hard to see all. Although the topic of lifestyle has a wide range of aspects, it is still shown in how people live and act in their daily life. In this theme, I would like to conduct doing research on the current lifestyle of boarding students in Ho Chi Minh University of Physical Education and Sport through having a survey on some below activities:

- Studying
- Daily living
- Communication
- Love life

In the aspect of doing research on Educational Psychology – Sociology (qualitative research), my study is quite complicated because it is at the level of criteria, requires measurement

scales, and checking the reliability before applying. There are three steps to conduct checking the measurement scales of questionnaires to access the current lifestyle of the study object.

Step 1: Questionnaire Template

Summarizing theorical and practical basis in the dormitory of Ho Chi Minh University of Physical Education and Sports, to create the questionnaire with 79 sections, including four questions about personal information and 75 questions about lifestyle.

Step 2: Adjusting the Questionnaire of Measurement Scales and Answering

Adjusting the questionnaire of measurement scales

The theme has developed the basic questionnaires, we have asked six people including boarding managers, specialists, and teachers to review structure, form, and content, the purpose of the questionnaire template to give the opinion and to test the measurement scales of current lifestyle of boarding students in Ho Chi Minh University of Physical Education and Sports. Therefore, the results have shown below:

One of six suggests adjusting four questions in three content.
One of six suggests removing one article (two questions) and adjust two questions in two articles.
One of six suggests removing one article (three questions) and adjust three questions in two articles.
One of six suggests adjusting three questions in two content.
One of six suggests adjusting two questions in two content.
One of six suggests adjusting one question in one content.

According to the survey, there are six opinions, in which there are 15 questions adjusted, five questions removed (two questions about personal information and three questions

Table 1: Describe the Cronbach's alpha coefficient's reliability of questionnaires about current study style of boarding student in Ho Chi Minh University of Physical Education and Sports

Question	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha
Theory				
Going to school on time	33.61	42.078	0.497	0.797
Preparing and reviewing documents before going to school	34.52	41.273	0.596	0.787
Wearing proper uniform	33.43	45.922	0.345	0.810
Picking a seat near the board to focus on studying	33.90	41.541	0.483	0.798
Actively contributing to the lessons and interact with teachers	34.63	40.685	0.567	0.789
Paying attention to lectures and taking notes	33.89	43.875	0.419	0.804
Using technology (laptop and smart phone) to access the knowledge in relation to subject.	34.47	43.150	0.453	0.801
Searching documents in the library.	35.31	42.034	0.425	0.805
Using school's website to track study result, timetable	33.92	44.340	0.328	0.813
Spending time on self-study	34.77	40.690	0.594	0.787
Solving the difficulties when having self-study time with friends and teachers	34.73	42.160	0.555	0.792
Cronbach's alpha = 0.814		Number of Items = 11		
Practice				
Preparing school things before having class	30.17	34.287	0.600	0.853
Gathering students before teachers come in.	30.17	35.389	0.571	0.855
Paying attention and following the teachers' direction	30.02	35.530	0.681	0.847
Supporting each other	30.31	34.013	0.715	0.842
Exchanging with teachers	30.69	33.462	0.671	0.846
Being a sample to contribute the lesson	30.83	35.246	0.502	0.863
Being proactive in discipline and practice	30.31	36.319	0.550	0.857
Proactively participating in training and following the regulations of the class	29.96	35.488	0.654	0.849
Practicing overtime to complete movement skills.	30.51	36.477	0.494	0.862
Cronbach's alpha = 0.867		Number of Items = 9		

about lifestyle). Basing on the survey results and opinions from specialists, I would like to adjust the questions and start to conduct collecting data by SPSS 20.0 application.

Determining forms of Answering

In this theme, we applied answer forms using Likert-5 level measurement scales to carry out the survey on 100 boarding students. The survey objects will choose from level 1 to 5: Level 1 as "never," level 2 as "sometimes," level 3 as "often," level 4 as "usually," and level 5 as "always" along with articles in relation with current lifestyle od boarding students in Ho Chi Minh University of Physical Education and Sports.

Step 3: Checking the Reliability of the Questionnaires using Cronbach's Alpha Coefficient

There are 73 questions in total to measure the student' lifestyle. To evaluate correctly the reliability of the questionnaires, I conduct to check using Cronbach's alpha coefficient for the below content: Studying (20 questions), daily living (22 questions), communication (21 questions), and love life (10 questions).

The results of testing evaluation criteria on the current lifestyle of boarding students using Cronbach's alpha coefficient are shown as table 2.1, 2.2, 2.3, and 2.4.

Table 2: Describe the Cronbach's alpha coefficient's reliability of questionnaires about the current lifestyle of boarding student in Ho Chi Minh University of physical education and sports

Question	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha
Community activities				
Participating in week activities	33.17	58.980	0.353	0.795
Attending flag salute ceremony monthly and school' activities	33.26	58.951	0.368	0.794
Participating in sports organized by school (traditional sports, boarding sports,.)	33.56	55.739	0.429	0.788
Responding to 7 days of voluntary	34.19	51.340	0.589	0.770
Participating in clubs (Marx-Lenin club, scientific research,..)	34.96	55.774	0.329	0.801
Part	34.92	52.626	0.529	0.777
Participating in cultural-musical movements (singing contest, ring the golden bell, the beauty of UPES student, ...)	34.22	55.420	0.369	0.795
Participating in Green summer campaign, spring voluntary,....	34.64	51.662	0.514	0.779
Participating in city or district activities (skill classes, voluntary days,...)	35.07	51.985	0.543	0.776
Being sociable, simple, and self-motivated,...	33.96	53.386	0.538	0.777
Living for people	33.91	55.492	0.523	0.780
Cronbach's alpha = 0.801		Number of Items = 11		
Personal living				
Sleeping before 11 pm	33.48	42.660	0.476	0.746
Getting up before 06 am	33.66	44.595	0.369	0.760
Morning workout	34.12	43.924	0.425	0.753
Having noon time	32.95	45.579	0.395	0.756
Practicing, joining club in every afternoon (5 pm–6:30 pm)	33.36	46.846	0.358	0.760
Watching the film, reading books, listening to music and playing sport in free time.	32.92	46.483	0.356	0.760
Spending free time on part-time job	33.27	45.609	0.403	0.755
Limit the personal expenses	33.06	43.160	0.501	0.743
Setting schedule for the week or month	33.57	42.799	0.522	0.740
Cleaning room	32.64	46.724	0.413	0.755
Keeping discipline and regulation	32.63	46.624	0.417	0.754
Cronbach's alpha = .770		Number of Items = 11		

Table 3: Describe the Cronbach's alpha coefficient's reliability of questionnaires about the current communication style of boarding student in Ho Chi Minh University of Physical Education and Sports

Question	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha
Communication topic (student for student)				
Studying	17.31	14.544	0.534	0.652
News and politics	17.91	13.655	0.487	0.663
Sports	17.09	15.716	0.423	0.684
Job	17.67	14.776	0.502	0.661
Entertainment, beauty	17.13	15.176	0.475	0.669
Others	17.69	14.217	0.330	0.727
Cronbach's alpha = .715		No. of Items = 6		
Communication topic (student with teacher)				
Studying (theory and practice)	12.17	13.878	0.703	0.755
Problems of life	12.61	12.894	0.756	0.735
Counseling (school selection and psychology)	12.80	13.061	0.736	0.742
Taking care	12.38	14.647	0.566	0.793
Depending on situation	12.42	15.920	0.334	0.864
Cronbach's alpha = 0.817		Number of Items = 5		
Communication (student for other objects, officials, students from other schools,…)				
Bowing, greeting, acquainting	4.85	7.987	0.868	0.949
Pretend to be aloof	5.32	6.548	0.928	0.900
Bowing and keep walking	5.18	6.946	0.897	0.923
Cronbach's alpha = 0.949		Number of Items = 3		
Communication tools				
Technology (email, social network, smart phone,...)	6.32	4.935	0.641	0.836
Direct communication	6.67	4.592	0.752	0.730
Letter	6.93	4.638	0.719	0.762
Cronbach's alpha = 0.840		Number of Items = 3		
Time for best friends				
Every afternoon	9.35	9.231	.458	.739
Evening	9.33	8.449	.589	.664
Noon and break time in school	9.44	8.556	.624	.646
Free time	9.17	9.307	.510	.708
Cronbach's alpha = 0.748		Number of Items = 4		

The testing results of Cronbach's alpha of questionnaires are shown in 2.1; total Cronbach's alpha coefficients are greater than 0.6, the corrected item-total correlation is greater than 0.3; therefore, the questionnaires above are reliable in terms of studying.

The testing results of Cronbach's alpha of questionnaires are shown in 2.3; total Cronbach' alpha coefficients are greater than 0.6, the corrected item-total correlation is greater than 0.3; therefore, the questionnaires above is reliable in terms of communication style.

The testing results of Cronbach's alpha of questionnaires are shown in 2.3; total Cronbach's alpha coefficients are greater than 0.6, the corrected item-total correlation is greater than 0.3; therefore, the questionnaires above is reliable in terms of love lifestyle.

Table 4: Describe the Cronbach's alpha coefficient's reliability of questionnaires about the current love life of boarding student in Ho Chi Minh University of Physical Education and Sports

Question	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha
For lover (best friend)				
Meeting	6.56	6.045	0.582	0.847
Sharing and supporting in studying and practicing	6.28	5.184	0.750	0.676
Sharing and supporting in life	6.07	5.760	0.704	0.728
Cronbach's alpha = 0.822		Number of Items = 3		
For family				
Taking care	6.71	4.781	0.671	0.786
Visiting family	6.94	4.282	0.715	0.742
Sending gift, letter, and mail	7.36	4.315	0.688	0.769
Cronbach's alpha = 0.831		Number of Items = 3		
For Physical Education career				
Being Honor and proud	4.26	0.971	0.627	
Loving and being dedicated to the career	4.14	1.388	0.627	
Cronbach's alpha = 0.763		Number of Items = 2		
For the school's regulation				
Following to the school's regulations	4.36	0.785	0.578	
Following to the dormitory' regulations	4.32	0.854	0.578	
Cronbach's alpha = 0.732		Number of Items = 2		

CONCLUSION

According to the initial preliminary questionnaires and adjusting questionnaire scale template, determining answer form as well as checking the reliability of questionnaire using Cronbach's alpha, the theme has created the evaluation criteria on the current lifestyle of boarding student in Ho Chi Minh University of Physical Education and Sports including 73 questions: Studying style (20 questions), daily living style (22 questions), communication style (21 questions), and love lifestyle (10 questions).

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Research Article

Professional and generalist teachers: Predicting self-efficacy in delivering primary school physical education

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ABSTRACT

The study intended to decide whether primary school teachers' motivational convention to do exercises and self-efficacy in deliver a physical education class are dissimilar based on their area of professional training. Two groups of eligible primary school teachers were participated; physical education specialists and a cluster of generalist primary school physical education teachers who educate physical education, art, and music. Every teacher accomplished the adapted Behavioral Regulation in Exercise Questionnaire-2, International Physical Activity Questionnaire, and the Teachers' Sense of Efficacy Scale. Generalist physical education teachers confirmed extensively top levels of inherent motivation toward keep fit involvement and had taken more physical movement in contrast to the specialist physical education teachers. The average mean analysis showed that a generalist physical education teacher predicted upper scores in instructional systems and classroom supervision in physical education. The results maintain the employ of Self Determination Theory concepts inconsiderate teacher's exercise partaking motivations. These results encompass the implications pro modeling responsibility of teachers in cheering students to be physically vigorous.

Keywords: Exercise participation, Competency, PE, Self-determination, Self-efficacy

INTRODUCTION

The history of self-efficacy begins within Bandura's (1977) social learning theory that was renamed Social Cognitive Theory in 1986. One of Bandura's major concepts in his theory is self-efficacy. According to theory and research Bandura (1995), self-efficacy makes a difference in how people feel, think, behave, and motivate themselves. In terms of feeling, a low sense of self-efficacy is associated with stress, depression, anxiety, and helplessness. Such individuals also have low self-esteem and become pessimistic about their accomplishments and personal development. In terms of thinking, a strong sense of efficacy facilitates cognitive processes and performance in a variety of settings, including quality of decision making and academic achievement. When it comes to behaving, self-efficacy can influence people's choice of activities. Self-efficacy levels can increase or hamper motivation.

People with high self-efficacy approach difficult tasks as challenges and do not try to avoid them. "People's self-efficacy beliefs determine their level of motivation, as reflected in how much effort they will exert in an endeavor and how long they will persevere in the face of obstacles" (Bandura, 1989). Bandura also explains the importance of self-efficacy as beliefs that function as "an important set of proximal determinants of human motivation, affect, and action."

These beliefs constitute a form of action through motivational, cognitive, and affective intervening processes. An example of a cognitive process pertains to setting personal goals. The higher the level of perceived self-efficacy, the higher the levels of goals people set for themselves, which leads to a higher level of commitment to the goals.

Bandura (1997) also believes that it is important for educators to have high levels of self-efficacy. Educators who have a high level of instructional efficacy function on the belief that difficult students are teachable through extra effort and appropriate techniques. In addition, when educators believe their instruction will have an effect on the student, their belief serves as a model for their students (Crain, 2000).

On the contrary, educators with low instructional efficacy think there is little they can do to help students if they

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appear unmotivated (Bandura, 1977). "Self-efficacy is the most important predictor of change in behavior" (Lenz and Shortridge-Baggett, 2002). This concept has obvious important implications for all physical education teachers.

Hence, the researcher wants to show the gap between self-efficacy and the real character of PE teachers currently in 4 zones' (West Gojjam, S/Gonder, E/Gojjam, N/Gonder) primary schools in Amhara Region. Hence, this research aimed to answerer the following research questions:

1. What was the present status of teacher's behaviors and teacher's self-determined motivation?
2. Did the modeling role of the primary school teachers play a part in influencing physical activity participation in children?
3. Did PE teacher's self-efficacy in delivering an effective PE lesson contribute to a positive (negative) learning environment?

MATERIALS AND METHODS

The researcher used an exploratory research design. An opportunistic sample of 80 diploma level qualified primary school physical education teachers were taken in this (exploratory) study. These teachers (Group 1) had undertaken Sport Science specific training program and would be considered competent in the planning, delivery, and evaluation of all areas of the statuary PE curriculum. While the 2nd group was generalist or esthetic primary school, physical education teachers have taken training in PE program, with a focus on the curricular areas of PE, music, and arts.

Physical activity levels were measured using the adapted short form of the International Physical Activity Questionnaire (IPAQ; www.ipaq.ki) and adapted to practical purpose. Mean minutes spent in MVPA per day and sitting time will be calculated for each group of participants.

For motivation to exercise, the 19 items Behavioral Regulation in Exercise Questionnaire-2 (BREQ-2; Markland and Tobin, 2010) used and adapted to measure the participant's level of self-determination toward exercise. Participants were respond to each question on a five-point Likert scale ranging from 0 = not true for me to 4 = very true for me.

For teachers' self-efficacy toward teaching PE, the 12 items short version of the Teachers Sense of Efficacy Scale (TSES; Tschannen–Moran and Woolfolk Hoy, 2001) were adapted so that questions specifically reflect confidence toward the teaching of PE, rather than being general about teaching. Participants were respond on a Likert scale of 1 = Nothing to 9 = A great deal.

To analyze the collected data through questionnaires, percentage and group means (M) were used to calculate each variable and group of teachers. An independent t-test was used for physical activity levels (IPAQ). For BREQ-2 and TSES percentage method was used to compare the two groups of teachers. The researcher utilized a quantitative approach to analyze the whole collected data for the research purpose.

RESULTS AND DISCUSSION

In terms of teaching service year of respondents, 3 (7.5%) General Physical Education Teachers (GPET) and 2(5%) Sport Sciences Teachers (SST) are <5 years, 8 (20%) GPET and 13 (32.5%) SST are 5–10 years, 9 (22.5%) GPET and 12 (30%) SST are 11–15 years, and the rest 20 (50%) GPET and 13 (32.5%) SST have served for more than 15 years.

Regarding behavioral regulation, exercising is a habitual behavior that suggests that people who are interested in exercising more should try to commit themselves to exercise for a while. By doing so, they affect not only their current well-being but also their future utility by making future exercise more beneficial. This type of self-enforcing mechanism is a possible explanation of the DellaVigna and Malmendier (2006). As a self-control mechanism, people may choose the more expensive plan because it reduces the marginal cost of attending to zero, and people believe that this will encourage them to attend the gym in the future.

The competitive factors measured evaluated and scored under behavior regulation in exercise by professional Esthetic and Sport Science Teachers. Sport Science Teachers scored 31 (77.5%) higher by disagreeing with "exercise because of other people support" and esthetic teachers also scored 30 (75%). However, some participants from sport science teachers agreed 7 (17.5%) with exercise because of other people support, while 6 (15%) of esthetic agreed in the same manner. However, some 2 (5%) sport science teachers and 4 (10%) esthetic teachers moderately agreed with the given issues. Many scholars shown that behavioral regulation processes are critical for exercise (Hagger and Chatzisarantis, 2008; Markland and Ingledew, 2007; Markland and Tobin, 2010; Standage *et al*., 2007). Although most people exercise for extrinsic reasons (e.g., to improve physical fitness and appearance, to lose weight, or for health reasons), they are unlikely to persist if they do not enjoy exercise or find it inherently satisfying. For this reason, "intrinsic motivation may be among the most important factors in maintaining exercise over time" (Ryan and Deci, 2007).

For feeling of guilty when not exercises, 13 (32.5%) of SST and 17 (42.5%) of GPET confirms that strongly disagreed. It showed that relatively greater numbers of GPET do not feel guilty when they not exercising and SST has a less guilty feeling when not exercising. On the other hand, 23 (57.5%) GPET and 27 (67.5%) SST replied their agreement on moderately agreed and above. Wilson *et al*. (2003) examined the relationships

between psychological needs, behavioral regulation, exercise attitudes, and physical fitness. They found that identified and intrinsic regulation were the only significant predictors of physical fitness and, as the previously reviewed research on exercise adherence and physical activity participation would suggest, that these relationships were positive.

In terms of valuing the benefit of exercise, 38 (95%) of SST and 36 (90%) of GPET replied that they agreed and above. This shows that both group respondents have almost the same knowledge and understanding toward the benefit of physical exercise. Scientifically, physical activity participation has been shown to provide numerous health benefits, including reduced mortality, decreased risk of coronary disease, stroke, some cancers, type 2 diabetes, osteoporosis, depression, decreased blood pressure and cholesterol, improved mental health, increased functional capacity, and improved physical fitness (U.S. Department of Health and Human Services, 2008).

For feeling of ashamed when miss exercise session, 17 (42.5%) from GPET group and 16 (40%) from SST of respondents disagreed and above for the issue. Which indicates a relatively equal proportion of teachers from both sides did not feel ashamed in missing exercise sessions. However, almost equal number of respondents from both groups moderately agreed and 16 (40%) of SST and 14 (35%) of GPET respondents replied agree and strongly agree for feeling of ashamed when they missed exercise sessions. To some extent, SST feeling is more than that of GPET.

Importance of exercising regularly for personal fitness is strongly disagreed only by 1 (2.5%) from GPET respondents, while 4 (10%) of SST replied the same. Conversely, 39 (97.5%) of GPET and 36 (90%) of SST respondents replied that their agreed and strongly agreed with the issue. We can see here how the understanding of GPET is relatively better than that of SST in understanding the importance of exercising regularly. The CDC (2008) outlined physical activity parameters that are necessary to sustain a healthy lifestyle. Behaviors include moderate-intensity physical activity for a minimum of 150 min/week or 75 min of vigorous-intensity activity per week and muscle-strengthening activities that increase strength and endurance of all major muscle groups at least 2 days/week. Moderate-intensity activities include walking, dancing, swimming, and jumping rope. Vigorous-intensity physical activity may include brisk walking, running, cycling, aerobics, swimming, or competitive sports. Muscle-strengthening activities are not to be included in minimum duration requirements for maintaining or improving health (CDC, 2008).

In the case of unable to see any change in exercising, respondents from GPET 33(82.5%) and from SST 36(90%) respondents responded disagree and strongly disagree. This indicates both groups properly understand depth concepts and effects of physical exercise on the body. Similarly, different professionals suggested that exercise may retard aging, help prevent age-related diseases, and prolong life span and enhance the efficiency of heart, skeletal muscles, lungs, metabolism, longevity, and mental health (Samorajski *et al*., 1985).

Concerning to controlling disruptive behavior in the classroom, 25 (62.50%) and 11 (27.5%) GPET responded great deal and quite a bit, respectively, but 16 (40%) and 20 (50%) of SST replied great deal and quite a bit accordingly. This implies that a relatively higher number of GPET have the capacity to control disruptive behavior in the classroom. Teachers' confidence in their ability to promote students' learning" (Hoy, 2000) was first discussed as a concept more than 30 years ago when these two items were included in studies conducted by researchers at the Rand Corp.: n "When it comes right down to it, a teacher really can't do much because most of a student's motivation and performance depends on his or her home environment." n "If I try really hard, I can get through to even the most difficult or unmotivated students" (Armor *et al*., 1976, in Henson, 2001).

On the other hand, for the item related to motivating students with law interest, 34 (85%) of GPET teachers and 31 (77%) of SST have answered quite a bit and above. Here, we can conclude that GPET teachers motivating students with low interest is relatively more than that of SST. The rest proportion of the two groups had equal responses on motivating students with law interest to some influence. Teachers who set high goals, who persist, who try another strategy when one approach is found wanting – in other words, teachers who have a high sense of efficacy and act on it – are more likely to have students who learn (Shaughnessy, 2004).

On the part of teachers' effort to get students to believe they can do well in the school, 39 (97.5%) of SST and 37 (92.5%) of GPET responded their efficacy on the issue quite a bit and above. This shows that both groups of respondents are very well in expending an effort to the learning of their students.

Teachers' practices in the classroom and their beliefs are some aspects that influence student engagement (Skinner and Belmont, 1993). Wiseman (2012) examined teachers' perceptions on what motivates students and students' perceptions on their own motivation. He found that teachers' and students' attributions are different. Students attribute their motivation to either their intrinsic motivation or to their goals they adopt, while teachers link students' motivation to their own characteristics.

Teachers are responsible to a higher understanding of their students in valuing their learning. Regarding to this, almost all respondents from both groups (97.5% GPET and 92.5%

SST) responded that they work for the valuing of learning by their students. This indicates how much physical education teachers are dedicated for the learning of students. In a study that examined the relationship between teachers' behavior and student engagement, it was found that teachers' behavior in the classroom predicts students' engagement (Skinner and Belmont, 1993).

Efficacy of teachers on using a variety of assessment strategies 22 (55%) GPET and 14 (35%) SST responded their practice a great deal while 15 (37.5%) GPET and 21 (52.5%) STT responded quite a bit. However, only a few 3 (7.5%) of GPET and 5 (12.5%) of SST responded some influence and below. The result showed that relatively from the two groups, GPET is higher using a variety of assessment strategies than SST. Teachers' instructional behaviors are influenced by their sense of efficacy beliefs (Tschannen-Moran *et al*., 1998). Bandura (1997) emphasizes the role of human beliefs on individuals' behaviors. Therefore, teachers' sense of efficacy is assumed to influence teachers' instructional practices in the classroom (Caprara *et al*., 2006).

Both groups with an equal proportion of 35 (87.5%) of each responded quite a bit and above in providing an alternative explanation for students in making issues too clear. We can infer that there is no difference between the two specialists and generalist teachers in the extent of providing an alternative explanation when students confused.

Holzberger *et al*. (2013) investigated the role of teachers' efficacy beliefs on their instructional quality. In this study, not only did teachers rate their own performance but also students rated the quality of their teachers' instructions. After analyzing the data, the researchers found a significant positive correlation between teachers' efficacy beliefs and their instructional quality. That is, the more efficacious the teachers are, the higher the students' perception of the quality of instruction.

Concerning to teachers' classroom experience to implement alternative strategies, 37 (92.5%) SST responded quite a bit and above, whereas 32 (80%) GPET for the same item responded quite a bit and above. Thus, SST is more experienced to implement alternative strategies in the classroom than GPET. Hoy (2000) suggests that "some of the most powerful influences on the development of teacher efficacy are mastery experiences during student teaching and the induction year." Thus, "the first years of teaching could be critical to the long-term development of teacher efficacy.

On the extent of insisting families to help their children do well in school, from both groups, only half 20 (50%) of respondents from each replied quite a bit and great deal. However, half proportion from each group responded some influence and below in accomplishing their responsibilities. Parental and families involvement in their children's education is critical to students' academic success. Community support of the educational process is considered as one of the main characteristics common to high-performing schools.

From the alternatives given means of transportations vehicle, bicycle, and walking SST mean 2.53 days/week and 32 min/day spent more time by means of vehicle transport than GPET mean 1.60 days/week and 20.88 min/day. Relatively, SST used more vehicle transportation than GPET.

Cycling is a healthy, low-impact exercise that can be enjoyed by people of all ages, from young children to older adults. It is also fun, cheap, and good for the environment. Riding your bicycle regularly is one of the best ways to reduce your risk of health problems associated with a sedentary lifestyle. Riding to work or the shops is one of the most time-efficient ways to combine regular exercise with your everyday routine. https://www.betterhealth.vic.gov.au/health/healthyliving/cycling-health-benefits

In case of movement by bicycle, GPET groups (mean 1.05) were more dominant than the SST group (mean 0.53). From this, we can assume that GPET has more experience of moving through a bicycle than SST.

Likewise, in walking, more GPET (mean 105.75) were participating than SST (mean 96.63). Here, we can conclude that the major transport system for both groups was walking. According to Walking and Cycling Strategy (2009), with a reduction in work-based physical activity and with most people living increasingly stressful lives, opportunities are needed to incorporate some form of regular physical activity into our lives. Allowing people to choose cycling or walking for transport provides good opportunities for increased physical activity.

In terms of vigorous home tasks at home per week GPET groups (1.85 d/w) a little bit better than SST (1.40 d/w).

In moderate home tasks per week, the average mean of SST was 2.48 d/w and GPET means indicated as 2.45. When we compare simple home task activity per week GPET (4.20 d/w) achieved more simple home task activities than SST group (3.83 d/w).

Regarding vigorous home task minutes per day, GPET group had 62.13 mean achievements while SST groups had 25.50 mean score. Likewise, in moderate home task minutes per day SST group had 118.55 mean score, whereas the GPET group had 79.50 mean score when we compare the two groups in terms of simple home task minute per day GPET group gained 102.50 while SST group gained 99.50. In general, from the above result, we can conclude that in vigorous home task and simple home task minutes per day GPET is better than SST.

In moderate home task activity per day, SST group is more advanced than GPET group.

CONCLUSION

The overall result of the study indicates the main professional self-efficacy and motivation of physical education specialist and generalist teachers in conduct primary school physical education curriculum. This study was applied to PE specialists and generalist primary school teachers and demonstrated that GPET had a higher level of self-determination toward exercise and professional self-efficacy in delivering the subject matter. They were more autonomous in their decisions, more physically active and had a higher level of perceived competence in delivering a PE lesson.

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Research Article

Anthropometric characteristics, playing experience, and team performance of male volleyball players in 2019 World Cup competition

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ABSTRACT

The present study was undertaken to find out the significant relationship between selected anthropometric variables and playing experience with the volleyball playing performance. Two hundred ninety-six national level male volleyball players from 12 different countries were selected as a subject for the present study with the age range between 16 and 39 years. The following anthropometric variables, that is, height, weight, spike height, and block height variables, and playing experience, were selected for analyzing the volleyball teams' success. The playing performance was analyzed by comparing the rank order (dependent variables) with anthropometric characters tics measurement of players, which was employed for the present study. The statistical test was computed using SPSS V-26. The result indicated that spike heights, block height from anthropometric, and playing experience variables were shown a significant relationship with the volleyball playing performance.

Keywords: Anthropometric, Playing experience, Team performance, Volleyball

INTRODUCTION

Volleyball is an all-round team-sport and it has been widely accepting as a highly competitive and recreational game throughout the world. Since its inception in 1895, it has not only developed from a slow-moving game into a fast one but has also become a game of high interest and joy to players and spectators alike. Volleyball, when promoted under sound leadership, brings out and sharpens the qualities of honesty, fair play, and sportsmanship in those who participate in it. Volleyball has an added advantage in being suitable for both sexes, regardless of age and physical ability, as it is highly adaptable.

Anthropometry has a rich tradition in sports sciences and sports medicine. Anthropometry studies the relationship of form and functions, the interactions of anatomy, growth, and performance (Stini, 1995). Anthropometric size and morphological characteristics play an important role in determining the success of an athlete (Rico-Sanz, 1998; Wilmore and Costill, 1999; and Keogh, 1999). Success in sports has associated with specific anthropometric characteristics, body composition, and somatotype (Carter and Heath, 1990; Duquet and Carter, 2001). Hence, volleyball coaches, managers, sports physiotherapists, and scientists, deep understanding of the determinants of achievement, such as the specific anthropometric characteristics of players, may be vital. Numerous studies have examined the associations between anthropometric and physiological characteristics of volleyball players Gladden and Colacino, 1978; Morrow *et al*., 1979; Kovaleski *et al*., 1980; Spence *et al*., 1980; Fleck *et al*., 1985; and Fry *et al*., 1991.

School sport experience and school sport background have been shown to be the strongest predictor of competitive involvement in sport for females and males, respectively (Curtis *et al*., 1999).

In spite of the accessibility of the literature correlated to anthropometric parameters in volleyball players, standard data on such parameters are insufficient in the worldwide

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context. To complete the gap of literature, the current study was designed.

Objective of the Study

The objective of the study was to find out the significant relationship of selected anthropometric variables and playing experience with the volleyball playing performance.

Research Questions

1. How is the relationship between anthropometric measurements and team performance?
2. What is the impact of players' playing experience on team performance?
3. To what extent is the difference between African and other countries teams' performance?

Table 1: Anthropometric characteristics of players by their team

Descriptive statistics of anthropometric variables					
Country of players	**Height**	**Weight**	**Spike height**	**Block height**	**BMI**
Argentina					
Mean	197.54	90.25	339.17	329.67	22.7217
SD	6.776	8.719	13.852	16.900	2.04847
Australia					
Mean	199.64	90.20	349.52	336.04	22.6144
SD	7.111	8.907	7.938	8.274	1.72035
Brazil					
Mean	197.56	88.52	337.04	313.88	22.6464
SD	10.940	11.605	17.603	23.948	1.71795
Canada					
Mean	199.00	91.00	348.64	323.00	23.1500
SD	7.257	9.478	12.682	12.832	1.70061
Egypt					
Mean	197.71	90.25	337.50	325.50	23.4650
SD	6.708	8.719	14.265	15.997	2.09338
Iran					
Mean	198.56	86.56	336.80	318.04	22.0004
SD	7.450	9.269	18.450	16.392	2.57249
Italy					
Mean	198.12	88.92	340.84	313.72	22.7340
SD	8.328	8.195	17.518	27.452	1.47914
Japan					
Mean	188.52	83.28	334.08	316.96	23.0824
SD	10.284	11.603	18.083	16.446	1.85564
Poland					
Mean	198.28	89.56	343.72	320.68	22.6480
SD	9.062	9.056	12.982	13.181	1.66117
Russia					
Mean	200.60	90.12	343.68	329.72	22.3764
SD	8.602	9.189	15.408	13.511	1.46863
Tunisia					
Mean	194.30	81.00	320.13	309.00	21.2013
SD	7.003	9.391	28.679	19.751	2.46051
USA					
Mean	197.28	89.56	345.60	327.80	22.9728
SD	8.060	8.846	15.753	13.525	1.91767

BMI: Body mass index, SD: Standard deviation

Table 2: Anthropometric characteristics of African and other continents' teams

Group statistics					
Variables	**Country classification**	***n***	**Mean**	**SD**	**SEM**
Height	African team	47	196.04	6.994	1.020
	Other continents teams	249	197.51	8.919	0.565
Weight	African team	47	85.72	10.101	1.473
	Other continents teams	249	88.79	9.631	0.610
Spike height	African team	47	329.00	23.919	3.489
	Other continents teams	249	341.92	15.859	1.005
Block height	African team	47	317.43	19.597	2.858
	Other continents teams	249	322.92	18.273	1.158
BMI	African team	47	22.3572	2.52881	0.36887
	Other continents teams	249	22.6945	1.83360	0.11620

BMI: Body mass index, SD: Standard deviation, SEM: Standard error of the mean

Table 3: Playing experience of African and other continents' teams

Report			
Playing experience per number of games			
Country of players	***n***	**Mean**	**SD**
Argentina	24	80.47	54.660
Australia	25	86.48	69.341
Brazil	25	28.56	18.399
Canada	25	61.35	48.672
Egypt	24	80.47	54.660
Iran	25	24.58	45.596
Italy	25	48.96	45.905
Japan	25	45.07	41.280
Poland	25	55.31	49.755
Russia	25	54.04	50.977
Tunisia	23	9.17	9.962
USA	25	72.67	70.248
Total	296	57.58	55.743

SD: Standard deviation

PROCEDURE AND METHODOLOGY

The data were collected using electronic source from FIVB official website (https://www.fivb.org/viewPressRelease.asp?No=88825&Language=en#.XcMnudJKjIU) Volleyball Men's World Cup 2019 Team rosters. For the present study, 296 national-level men volleyball players' from 12 world teams who participated in the 2019 world cup with an age range between 16 and 39 years were selected as participants. On the basis of availability of teams' profile, the following anthropometric variables and overall volleyball playing experience were selected for this study. Performance in volleyball was selected as the dependent variable. Performance score was obtained through teams' rank ratings in playing ability. The combined result of each team's rank and selected criteria served as the final score of its overall playing ability score in volleyball. Each anthropometric criterion and playing experience were compared with teams' rank for measuring the performance.

To analyze the anthropometrical variables and playing experience with the team performance, descriptive statistical and independent-sample *t*-test analysis were used.

RESULTS AND DISCUSSION

The overall anthropometric characteristic result of participants showed a total mean value of height 197.28 (8.65) cm, weight 88.30 (9.75) kg, spike height 339.87 (17.97) cm, block height 322.05 (18.57) cm, and body mass index (BMI) 22.64 (1.96) kg/m^2. These results revealed that the extent to which high standard deviation observed in height, weight, spike height, and block height among world volleyball team players by the year of 2019 world cup competition [Table 1].

Indeed, it can be assumed that a player's anthropometric characteristics can, in some way, influence his/her level of performance, at the same time helping to determine a suitable physique for a certain sport (Carter and Health, 1990).

In terms of height, the Argentina team had an average mean height of 195.5 cm (6.78), Russia 200.60 cm (8.60), Tunisia 194.30 cm (7.003), USA 197.28 cm (8.06), and Australia 199.64 cm (7.110). When we compared players' height that the Russian national team had a greater mean height of 200.60 cm (8.60), and the Japan team had a lower average mean height of 188.52 cm (10.28). The height of a volleyball player has been considered as the most important pre-requisite and

Table 4: Playing experience of African and other continents' teams

Group statistics [Table 3]					
Variables	**Country classification**	***n***	**Mean**	**SD**	**SEM**
Playing experience per number of games	African team	47	58.36	55.71	8.705
	Other continents teams	249	60.36	55.84	3.912

SD: Standard deviation, SEM: Standard error of the mean

positive predisposition for better performance (Kansal *et al*., 1983; Bale, 1986).

Regarding to spike height, the highest average mean score 349.52 cm (7.94) is gained by the Australian team, whereas the lowest spike height mean 320.03 cm (28.68) is gained by Tunisian team. According to Gutierrez and Marcos (2009), the factors that affect vertical jump are height reached by the center of gravity, the time required for execution, and the spatial orientation of the corporal segments.

Comparatively, the highest block height score of 336.04 cm (8.27) was achieved by the Australian team, and the lowest point 309.00 cm (19.75) was scored by the Tunisian team. The main purpose of volleyball players is achieving greater height on the net (Stec and Smulsky, 2007). Nowadays, players who are able to achieve greater height during performing spike and block, as the most valuable skills in volleyball, have the advantages compared to other players, which are possible with the ability of higher jumping (Ciccarone *et al*., 2007) [Table 2].

It was evident from Table 3 that the mean height of African teams is 196.04 (6.99) and other contents' teams are 197.51 cm (8.92). It is clear that African teams have less height than the rest of the world. Hence, height is highly correlated with teams' performance. On the other hand, other continents' players had average mean weight of 88.79 kg (9.63), and African teams' players had 85.72 kg (10.10). The result showed that African teams had less weight than other countries, but not the significance difference observed.

In terms of Spike height, other continents' teams scored 341.92 cm (15.860) mean height, and African teams gained 329.00 (23.92) points. It is evident that other continents' teams are better at Spike height than African teams.

When we compare Block height, African teams scored 317.43 cm (19.60), while other continents' teams obtained 322.92 cm (18.27) on average. Thus, African teams had weaker block height. Therefore, it clear that teams from Africa participate in international volleyball completions but never won even once.

The average playing experience of world teams indicated 57.58 (55.74) games. This means most team players had "0" minimum playing experience in world championships, olympic games, and other games international games.

At the individual team, level indicated [Table 3] that Australian team players scored 86.48 (69.34) the USA, 72.67 (70.25), both Argentina and Egypt 80.47 (54.66), Russia 54.04 (50.98), Poland 55.31 (49.76), Italy 48.96 (45.90), Canada 61.35 (48.67), Japan 45.07 (41.28), Iran 24.58 (45.60), Brazil 28.56 (18.40), and Tunisia 9.17 (9.96) mean points. Australian players had the highest, while African (Tunisian) team players got the least scores.

We can observe from Table 4 that African teams gained less playing mean experience, 58.36 (55.71) than other continents teams achieved 60.36 (55.84).

The team performance result indicates that from 12 teams Brazil, Poland, and the USA ranked 1–3, respectively, while others Argentina, Russia, Italy, Iran, Canada, Egypt, Australia, and Tunisia scored 4–12 accordingly.

Even if the anthropometric characteristics and playing experience of the Australian team relatively higher than from all teams, but in terms of team performance, it ranked parallel to African teams (Egypt and Tunisia) which are relatively the list on their anthropometric profile and playing experience (Tunisia).

CONCLUSION

In general, spike height, block height, and playing experience had a good relationship with team performance. All the 12 teams had normal BMI. In addition to the anthropometric and physiological characteristics, skills such as group dynamics, social skills, and playing strategies may be important determinants of success in team sports (Carter, 2003).

Recommendation

Based on the result of the findings, the researcher recommended the following points.

1. Anthropometric profile and playing experiences are not the only indicators for team performance so that volleyball federations/coaches should consider other performance determinant factors as players' selection criteria in addition to anthropometric profile and playing experiences.
2. Other investigators can conduct on other team performance determinant factors.

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Research Article

Association of weight, speed, and achievement motivation with playing ability of basketball players

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ABSTRACT

The purpose of the study was to scientific appraisal, evaluation, and prediction of basketball performance from selected anthropometric, physical fitness, and psychological variables are present in the literature. These studies involved in finding out the relationship of playing ability from isolated anthropometric measurements or physical fitness variables or psychological variables. The main objective of this research is an appraisal of selected variables as prerequisites for basketball performance, taking to consideration of a combination of anthropometric, physical fitness, and psychological variables. In doing so, the investigator would assess the present status of basketball players' anthropometric, physical fitness, and psychological variables along with their playing ability. The subjects selected for the pilot study phase were five state-level basketball players. The age group of the subjects selected was ranking from 18 to 25 years. Further, the investigator would associate every variable selected with basketball playing ability. In this study, the relationship between selected anthropometric, physical fitness, and psychological variables with playing ability were found from 100 basketball players with the help of selected predictor variables such as weight, speed, and achievement motivation. The basketball playing ability was determined through subjective rating by three experts and was used as the criterion variable. The backward multiple regression method was used to determine the association between anthropometric, physical fitness, and psychological variables and playing ability of basketball players.

Keywords: Achievement motivation, Basketball players, Speed, Weight

INTRODUCTION

Measurement and evaluation of performance are essential to determine how well the formulated objectives have been met, how efficient the process has been, and how good the product is. The results indicate the direction and the rate of change in performance. "In athletics and physical education, as in education and in life, the teacher and coach are constantly evaluating and measuring" (Meissner and Meyers, 1940). The most valid form of evaluation is the use of well-established criteria as a basis for comparisons based on the association of selected parameters with playing ability.

Game of Basketball

Sports are an enjoyable means of increasing physical fitness and relieving tension. It takes skills to be good; furthermore, it takes skill to have a good sense. One tends to participate in those activities in which he possesses some skill and enjoys those activities in which his skill is better than average. Skill tests and learning are very closely related to neuromuscular coordination. Fundamental skills are universal in nature and common to all races, whereas their adaptation into games. The fundamental skills are frequently measured in physical tests such as a dash, a throw for distance, a jump, and the like. Skill tests are usually conducted to test the ability of the students in the skill of sports and major games. Skill tests are necessary to find out, how far the students understood the material and subject matter, which have been taught in the class; as far as practical session is concerned in sports and physical education, the skills tests are necessary to enlighten the progress of students in their subject matter.

Anthropometric Measurements

Anthropometric measurement is defined as a set of noninvasive, quantitative techniques for determining an individual's body fat composition by measuring, recording, and analyzing specific dimensions of the body, such as height and weight; skin-fold thickness; and bodily circumference at the waist, hip, and chest.

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Physical educators have long realized that the performance of men and women is greatly influenced by such factors of age, height, arm length, leg length, and body structure.

Objectives of the Subject

- Scientific appraisal, evaluation, and prediction of basketball performance from selected anthropometric, physical fitness, and psychological variables are present in the literature.
- These studies involved in finding out relationship of with playing ability from isolated anthropometric measurements or physical fitness variables or psychological variables.
- The main objective of this research is an appraisal of selected variables as prerequisites for basketball performance, taking to consideration of a combination of anthropometric, physical fitness, and psychological variables.
- In doing so, the investigator would assess the present status of basketball players' anthropometric, physical fitness, and psychological variables along with their playing ability.
- Further, the investigator would associate every variable selected with basketball playing ability.

Statement of the Problem

The purpose of the study is to make an appraisal of selected anthropometric, physical fitness, and psychological variables and playing ability of state-level basketball players. To find out the relationship between playing ability and selected anthropometric, physical fitness, and psychological variables of state-level basketball players.

Significance of the Study

In the recent year's physical educators, coaches' sports experts, and even most of the players have realized the importance of playing ability. The significance of the study is based on the fact that performance in basketball measured through playing ability can be found association from selected anthropometric, physical, and psychological variables.

1. This study will help to evaluate selected anthropometric, physical fitness, and psychological levels of state-level basketball players and compare the abilities and capacities of the players by themselves and by coaches and physical educators.
2. The result and findings of this study would provide criteria for selecting potential basketball players.
3. This study might be utilized as a screening instrument in analyzing and classifying the basketball players.
4. The outcome of the results shall be helpful to basketball coaches and physical educationists to concentrate at the selected variables of this study, which might be having a high correlation with playing ability to design the training program.
5. The result of the study would be making it clear whether the selected independent variables are directly or indirectly related to the criterion variables.
6. The result and findings of this study may guide basketball players on their playing ability.
7. This study will help the budding researchers to take up similar studies in other areas and disciplines.

Delimitations

1. This study was conducted in two phases, namely, a pilot study in which the investigator ascertained the reliability of subjects, instruments used, and tests to be administered and final phase of measuring selected anthropometric, physical fitness, psychological variables, and playing ability of the basketball players.
2. The subjects selected for the pilot study phase were 5 state-level basketball players.
3. The age group of the subjects selected was ranking from 18 to 25 years.
4. The subjects were drawn from state-level basketball players who were represented the state in interstate competitions.
5. The evaluation of the playing ability was subjectively measured only with the help of three experts.

Limitations

- The environmental factor for the study could not be controlled as subjects for the study were the state-level basketball players and they differed in their routine habits etcetera.
- The subjects were undergoing different types of physical activities and the effect of these activities could not be controlled.
- The diet and experience of the subjects were not considered in this study.

METHODOLOGY

In this chapter, the selection of subjects, research design of the study, selection of subjects, orientation of subjects, selection of variables, reliability of instruments, competency of tester, reliability of data, test-retest administration, subjective assessment of playing ability, and the statistical procedure used has been explained.

Selection of Subjects

The generalizability of research results is the selection of sample which will provide the research data. A sample is a small proportion of a population selected for observation and analysis. A sample reflects the characteristics which define the population from which it is selected. The purpose of this study was to find out the association of anthropometric, physical, psychological, and parameters with playing ability of basketball players to achieve these purpose 100 basketball players, who represented their state in interstate basketball tournaments the age group of 18–25 years.

Selection of Variables

Based on the available scientific literature pertaining to finding out relationships of selected variables with playing ability in consultation with experts, the following criterion variables were selected for this study to find the association with the basketball playing ability of the subjects.

Physical fitness variables

1. Weight
2. Speed.

Psychological variables

Achievement motivation.

Criterion Measures

- Anthropometric variable weight was measured through the weighing machine and the scores recorded in the nearest 1/10th of a kilogram.
- Physical fitness variable, speed was measured through 50 M run test and scores recorded in 1/10th of a second.
- Achievement motivation was measured through the Sports Achievement Motivation Questionnaire (SAMQ) developed by Dr. M. L. Kamlesh (1993) was used for measuring achievement motivation.

Subject Reliability

The subjects selected for this study were state-level basketball players played at state-level competitions. The players had adequate experience in playing the game. They were well trained in all skills and participated a number of tournaments. They involved in this study impartially and they were considered reliable for the purposes of this study.

Collection of Data

The data for the criterion variables were collected by administering the appropriate standard tests. The procedure for administering the test is explained below. Before administering the test, the purpose and procedure were explained to the subjects in details.

Administration of Tests

- Weight

Objective

To measure weight.

Apparatus Used

Weighing machine.

Test Description

The weights of the subjects were taken on a weighing machine with the subjects wearing short and vest only. They stood on the weighing machine and weight was recorded nearest to 1/10th of a kilogram.

Speed (50 M run test)

Purpose

To measure the speed.

Materials used

Two stop watches, measuring tape, clapper, and track marking 50 m.

Instruction

The subjects were advised to run in their own line from the starting to finish, with maximum speed. The command used for starting was "on your mark," "set," and "Clap."

Procedure

Two lines were marked 50 m apart from the starting line and finish line. On the command, "clap," the subject ran as fast as possible across the finish line to cover 50 m area.

Scoring

The elapsed time was measured to the nearest one-tenth of a second.

Sports Achievement Motivation

SAMQ developed by Kamlesh (1993). The questionnaire aimed at assessing the sports achievement motivation of the subjects. The questionnaire consists of twenty statements with the response from the subject "Yes" or "No" based on the response of the subject, their sports achievement motivation was measured using the key of the score of the author. The total score was the number of correct responses of the subject and it was the achievement motivation of the subject.

Statistical Techniques

The primary purpose of this study was to find out the association between selected anthropometric, physical fitness, and psychological variables with playing ability of state-level basketball players. To arrive meaningful findings, the following statistical tools were computed.

RESULTS AND DISCUSSIONS

The analysis of data collected from the samples under study. The purpose of the study was to find out the association of selected anthropometric, physical, and psychological variables with playing ability of basketball players. To achieve the purpose of the study, the investigator selected hundred basketball players, who represented Andhra State in interstate basketball tournaments and the age group of the subjects was 18–25 years. All the subjects had participated in the state-level competitions and represented their states. The researcher reviewed the number of books, journals, research articles, and coaching manuals and found that playing ability of a basketball player may have an association with selected anthropometric, physical fitness, and psychological variables. Based on these

observations, the investigator selected the following variables for this study.

COMPUTATION OF ASSOCIATION ON ANTHROPOMETRIC VARIABLES WITH PLAYING ABILITY

Descriptive Analysis

The association of anthropometric variables with the playing ability of basketball players was statistically computed. In descriptive statistics, the number of subjects tested, mean, and standard deviation of the motor fitness parameters is presented in Table 1.

Table 1 shows that the obtained mean value of the playing ability of the basketball players was the mean value on height was 64.37, with a standard deviation ± 3.97.

ANALYSIS OF COEFFICIENT OF CORRELATION

The obtained values were subjected to statistical treatment to find out the association between anthropometric variables with the playing ability of the subjects. The results are presented in Table 2.

COMPUTATION OF ASSOCIATION ON PHYSICAL FITNESS VARIABLES WITH PLAYING ABILITY

Table 3 shows that the obtained mean value on speed was 6.502, with a standard deviation ± 0.311.

Table 1: Descriptive statistics on anthropometric variables selected for this study

Variables	Mean	SD	*n*
Weight	64.37	3.974	100

Table 2: Correlation of coefficient between motor fitness parameters and playing ability of the subjects

S. No.	Variables	Correlation coefficient	Level of sig.
	Playing ability versus		
1	Weight	0.340*	<0.05

Required table r value playing ability and weight (−0.340), *Significant at 0.05 level

Table 3: Descriptive statistics on physical fitness variables selected for this study

Variables	Mean	SD	*n*
Speed	6.5020	0.31112	100

ANALYSIS OF COEFFICIENT OF CORRELATION

The obtained values were subjected to statistical treatment to find out the association of each physical fitness variable with the playing ability of the subjects. The results are presented in Table 4.

The results presented in Table 4 proved that there was a significant relationship between playing ability and speed (r: −0.652), as the obtained "r" values were greater than the required "r" value of 0.197 to be significant at 0.05 level.

COMPUTATION OF RELATIONSHIP ON PSYCHOLOGICAL PARAMETERS WITH PLAYING ABILITY

Descriptive Analysis

The association of psychological variables with the playing ability of basketball players was statistically computed. In descriptive statistics, the number of subjects tested, mean and standard deviation of the physiological parameters are presented in Table 5.

Table 5 shows the obtained mean value on achievement motivation was 13.65, with standard deviation ± 1.527.

Analysis of Coefficient of Correlation

The obtained values were subjected to statistical treatment to find out the association of each psychological variables with the playing ability of the subjects. The results are presented in Table 6.

Table 4: Correlation of coefficient between physical fitness variables and playing ability of the subjects

S. No.	Variables	Correlation coefficient	Level of sig.
	Playing ability versus		
1	Speed	−0.652	<0.05

Required table r value $(1.99)_{0.05}$ = 0.197, *Significant at 0.05 level

Table 5: Descriptive statistics on psychological parameters selected for this study

Variables	Mean	SD	*n*
Achievement motivation	13.65	1.527	100

Table 6: Correlation of coefficient between psychological variables and playing ability of the subjects

S. No.	Variables	Correlation coefficient	Level of sig.
	Playing ability versus		
1	Achievement motivation	0.850	<0.05

Required table r value $(1,99)_{0.05}$ = 0.197, *Significant at 0.05 level

The results presented in Table 6 proved that there was a significant association between playing ability and achievement motivation (r: 0.85), the obtained r values were greater than the required table r value to be significant at 0.05 level 0.197.

DISCUSSIONS ON FINDINGS

In this study, the relationship between selected anthropometric, physical fitness, and psychological variables with playing ability was found from 100 basketball players with the help of selected predictor variables such as weight, speed, and achievement motivation. The basketball playing ability was determined through subjective rating by three experts and was used as the criterion variable. The backward multiple regression method was used to determine the association between anthropometric, physical fitness, and psychological variables and playing ability of basketball players.

Physical fitness and psychological variables with playing ability, backward multiple regression was analyzed for each category of variables, namely, parameters associated with playing ability from selected anthropometric variables, associated with playing ability from selected physical fitness variables, and psychological variables associated with playing ability from selected anthropometric variables were studied.

DISCUSSIONS ON HYPOTHESIS

For the purpose of this study, the following hypotheses were formulated.

- It was hypothesized that the anthropometric variable weight would be significantly associated with the playing ability of state-level basketball players. Moreover, basketball playing ability can be successfully predicted by selected anthropometric variables.
- It was hypothesized that the physical fitness variables, speed would be significantly associated with the playing ability of state-level basketball players. Moreover, basketball playing ability can be successfully predicted by selected physical fitness variables.
- It was hypothesized that the psychological variables, achievement motivation of control would be significantly associated with the playing ability of state-level basketball players. Moreover, basketball playing ability can be successfully predicted by selected psychological variables.

FINDINGS

The study found a significant association between playing ability and anthropometric variables height and physical fitness variables agility, psychological variables, achievement motivation, and self-confidence.

CONCLUSIONS

Within the limitations and delimitations of the study, the following conclusions were drawn.

- It was concluded that selected anthropometric variable weight was significantly associated with the playing ability of basketball players.
- It was concluded that physical fitness variables speed was significantly associated with playing the ability of basketball players.
- It was concluded that psychological variables achievement motivation was significantly associated with the playing ability of basketball players.

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Research Article

Effects of psychoregulative program, autogenic training and yoga training on anxiety, and self-confidence of intercollegiate level kabaddi players

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ABSTRACT

The purpose of the study, random group design was employed. The randomly selected 60 kabaddi players were divided into three groups, consisting of 20 kabaddi players in each group. Group one was placed in experimental Group I which practiced psychoregulative program of yogasanas and group two, in experimental Group II, which practiced psychoregulative program autogenic training for 12 weeks. The third group was a control group, which did not participate in any of the psychoregulative programs. Before the experimental treatments, all the subjects were tested on anxiety and self-confidence which formed pre-test scores. After the experimental treatment, the subjects were once again tested on their anxiety and self-confidence. The difference between the pre- and post-test scores was the effect of psychoregulative programs, yoga practices, and autogenic training. The differences in means were tested statistically using ANCOVA. Where significant F value was obtained, the results were further subjected to statistical treatment, *post hoc* analysis, using Scheffe's *post hoc* test. In all cases, 0.05 level.

Keywords: Anxiety, Self-confidence

INTRODUCTION

Physical education field services a lot for an individual to be a healthy person. Man needs to participate in physical education for active growth and development and also maintain in good health. In recent years, athletic performances have been transformed skill techniques and training regimes have been vastly improved. Performance standards and records are being constantly improved. The advancement of scientific researches in the field of physical education and sports given a boon to athlete, trainees, and coaches. The physical education scientists have been trying to develop new methods of training and techniques to attain a higher level of performance in sports and games. Physical education experts are perfectly right who they say that physical fitness is the first essential of healthful living and unquestionably the mental hygienists are right too when they say that the mind functions best in healthy living, physical fit body.

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Objectives of the Study

a. The aim of this study was to find out the effect of psychoregulative programs that would benefit kabaddi players.
b. In doing so, the study would find out the effect of psychoregulative programs, namely, yogic practices and autogenic training that would influence selected psychological variables of kabaddi players.
c. The study further determines the effect of psychoregulative programs, namely, yogic practices and autogenic training on psychological variables, temperament, anxiety, aggression, achievement motivation, self-confidence, and stress.

STATEMENTS OF THE PROBLEM

The purpose of the study was to investigate and compare the effects of psychoregulative program autogenic training and yoga training on anxiety and self-confidence of intercollegiate level kabaddi players.

Hypotheses

On the basis of the conclusion drawn through critical and allied literature related to the study, the investigator has framed the following hypotheses:

1. It was hypothesized that there would be a significant difference in the selected anxiety and self-confidence of kabaddi players due to the influence of 12 weeks of autogenic training compared to the control group.
2. It was hypothesized that there would be a significant difference in the anxiety and self-confidence and to finally improve the performance levels of college-level kabaddi players due to the influence of 12 weeks of Yoga training compared to the control group.
3. It was hypothesized that there would be a significant difference between autogenic training and yoga training on anxiety and self-confidence.

Delimitations

- The study was delimited to 60 male kabaddi players who participated at intercollegiate level tournaments from different colleges of Andhra Pradesh. In the age ranging from 19 to 25 years.
- The study was delimited to 12-week training of autogenic technique and yoga training on anxiety and self-confidence only.
- The study was further delimited to the assessment of anxiety and self-confidence variables using standard tests.

Limitations

1. The reliability of data collected was dependent largely upon the interest and cooperation extended by the subject. This has been recognized as one of the limitations of the study.
2. The researcher adopted no motivational technique and this may also be considered as a limitation.
3. The economic background of the subjects was considered in this study, which is taken as a limitation.
4. The personality differences among the subjects were not considered for this study which was also one of the limitations of the study.

METHODOLOGY

In their selection of subjects, selection of variable, selection of questionnaires, experimental design, reliability of data, intervention training techniques administration of questionnaires, collection data, and statistical technique used have been explained.

Selection of Subjects

Sixty male kabaddi players studying in different colleges in Andhra Pradesh, who represented their colleges in inter-collegiate level competitions in Kabaddi, were randomly selected for this study. The subjects were in the age group ranging from 19 to 25 years. All the subjects were well versed in their skills and performance of the game hockey.

Selection of Variables

The research scholar reviewed the available scientific literature to related psychoregulative programs, autogenic training and yoga training on selected anxiety, and self-confidence variables from various journals and websites. Based on the recommendations of the studies reviewed, the following variables were selected.

Dependent Variables Selected

1. Anxiety
2. Self-confidence.

Independent Variables

1. Autogenic training for 12 weeks
2. Yoga training for 12 weeks.

Experimental Design

For the purpose of the study, random group design was employed. The randomly selected 60 kabaddi players were divided into three groups, consisting of 20 kabaddi players in each group. Group one was placed in experimental Group I, which practiced psychoregulative program of yogasanas and group two, in experimental Group II, which practiced psychoregulative program autogenic training for 12 weeks. The third group was a control group, which did not participate in any of the psychoregulative programs.

Before the experimental treatments, all the subjects were tested of anxiety and self-confidence, which formed pre-test scores. After the experimental treatment, the subjects were once again tested on their anxiety and self-confidence. The difference between the pre- and post-test scores was the effect of psychoregulative programs, yoga practices, and autogenic training. The differences in means were tested statistically using ANCOVA. Where significant F value was obtained, the results were further subjected to statistical treatment, *post hoc* analysis, using Scheffe's *post hoc* test. In all cases, 0.05 level.

Criterion Measures

The following criterion measures were adopted to measure the test.

1. To find out the effect of psychoregulative programs on anxiety, sports competitive anxiety index authored by C.D. Speilberger (1976) was administered.
2. To find out the effect of psychoregulative programs on self-confidence, the questionnaire authored by Hardy and Nelson self-confidence questionnaire.

Autogenic Training

Johannes Schultz (1932) autogenic training was adopted for the study. The subjects were taught and given practical sessions for the duration of 15–20 min, thrice a week for a period of 6 weeks.

Autogenic training is composed of three component parts. The first and most important component in the six initial steps designed to suggest to the mind a feeling of warmth in the body and heaviness in the limbs. These six self-statement steps are as follows:

- Heaviness in the arms and legs (beginning with dominant arm or leg).
- Warmth in the arms and legs (again beginning with dominant arm or leg).
- Warmth in the chest and perception of reduced heart rate.
- Calm and relaxed breathing.
- Warmth in the solar plexus area.
- Sensation of coolness on the forehead.

Yoga Training

Asanas can be performed from different positions, namely, standing, sitting, and lying and involve of movements such as bending forward, backward and sideways, and twisting. The daily program should include poses done from different positions so as to involve the whole body.

The training program was scheduled for one session in the morning and another session in the evening for 5 days (Monday to Friday) a week and the same was continued for 8 weeks.

*5 min – warming up and stretching *50 min – Asanas *5 min – Relaxation.

Table 1: Scoring pattern of anxiety questionnaire

S. No.	Response	Score of positive statements	Score of negative statements
1	Not at all	1	4
2	Somewhat	2	3
3	Moderately so	3	2
4	Very much	4	1
Positive statements		1,2,5,8,10,11,15,16,19,20	
Negative statements		3,4,6,7,9,12,13,14,17,18	

Anxiety

Anxiety was measured through the anxiety questionnaire. The anxiety questionnaire was designed to measure the degree of anxiety experience before the competition.

It was developed by Spielberg (1979). Spielberger's trait anxiety questionnaire was given to all subjects. Twenty items were adopted from Spielberger's trait anxiety questionnaire for this investigation. The complete questionnaire is score as follows [Table 1]:

Self-confidence

Standerd Hardy and Nelson (1992) questionnaire for self-confidence were used to scale the self-confidence level of sedentary schoolboys. The test consists of four questions, with six levels of responses. The levels of change from strongly disagree to strongly agree. The respondents were made to encircle the appropriate number which suited their attitude. The scale was revalidated by administering the questionnaire on all three groups of students consisting of 60 students from Ramakrishna Mission Higher Secondary School, Chennai.

Scoring

This scoring range of this questionnaire was 4–24. The higher score indicates a high level of self-confidence.

RESULTS AND DISCUSSION

Results on Anxiety

The statistical analysis comparing the initial and final means of anxiety due to 12 weeks psychoregulative programs, namely, yogic practices and autogenic training among college kabaddi players, is presented in Table 2.

As shown in Table 2, the obtained pre-test means on anxiety on yogic practices group was 72.65, autogenic training group was 70.7 was and control group was 69.3. The obtained pre-test F value was 2.69 and the required table F value was 3.16,

Table 2: ANCOVA results on the effect of yogic practice and autogenic training compared with controls on anxiety among college kabaddi players

	Yogic practices	Autogenic training	Control group	Source of variance	Sum of squares	df	Mean squares	Obtainedf
Pre-test mean	72.65	70.7	69.3	Between	113.23	2	56.62	2.69
				Within	1198.95	57	21.03	
Post-test mean	64.9	65.9	68.7	Between	155.20	2	77.60	4.51*
				Within	979.80	57	17.19	
Adjusted post-test mean	65.89	64.95	68.66	Between	137.23	2	68.62	3.93*
				Within	978.86	56	17.48	
Mean diff	−7.75	−4.80	−0.60					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df)=3.16, 2 and 56 (df)=3.16. *Significant

which proved that there was no significant difference among initial scores of the subjects.

Since significant differences were recorded, the results were subjected to *post hoc* analysis using Scheffe's confidence interval test. The results were presented in Table 3.

Table 3: Multiple comparisons of paired adjusted means and Scheffe's confidence interval test results on anxiety

Means				Required CI
Yogic practices group	Autogenic training group	Control group	Mean difference	
65.89	64.95		0.95	3.32
65.89		68.66	−2.76	3.32
	64.95	68.66	−3.71*	3.32

*Significant

The *post hoc* analysis of obtained ordered adjusted means proved that there were no significant differences existed between yogic practices group and control group (MD: −2.76). There was a significant difference between autogenic training group and control group (MD: −3.71). There was no significant difference between treatment groups, namely, yogic practices group and autogenic training group. (MD: 0.95). The ordered adjusted means were presented through a bar diagram for a better understanding of the results of this study in Figure 1.

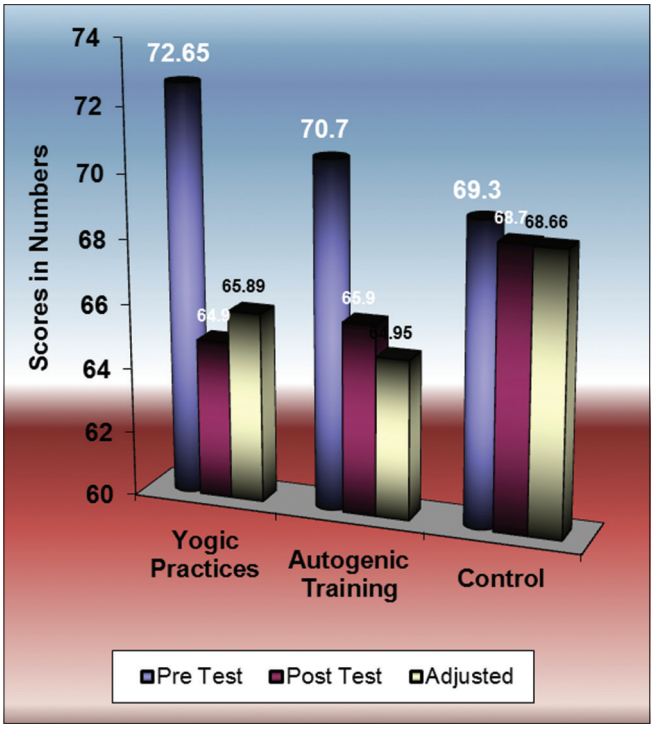

Figure 1: Bar diagram showing pre-test, post-test, and ordered adjusted means on anxiety

DISCUSSION ON FINDINGS ON ANXIETY

To find out the comparative effect of psychoregulative programs, namely, yogic practices and autogenic training on anxiety, the obtained pre and post-test means were subjected to ANCOVA and *post hoc* analysis through Scheffe's confidence interval test.

The effect of yogic practices and autogenic training on anxiety is presented in Table 4. The analysis of covariance proved that there was a significant difference between the experimental group and control group as the obtained F value 3.93 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to *post hoc* analysis and the results presented in Table 5 proved that there was no significant difference between yogic practices group and control group (MD: −2.76) and autogenic training group and control group (MD: −3.71). Comparing between the treatment groups, it was found that there was no significant difference between yogic practices and autogenic training group among college kabaddi players.

Thus, it was found that autogenic training was significantly better than control group in reducing the anxiety of the college kabaddi players.

RESULTS ON SELF-CONFIDENCE

The statistical analysis comparing the initial and final means of self-confidence due to 12 weeks psychoregulative programs, namely, yogic practices and autogenic training among college kabaddi players, is presented in Table 4.

As shown in Table 4, the obtained pre-test means on self-confidence on yogic practices group were 16.6, autogenic training group was 16.5 was, and control group was 15.8. The obtained pre-test F value was 1.10 and the required table F value was 3.16, which proved that there was no significant difference among initial scores of the subjects.

The obtained post-test means on self-confidence on yogic practices group was 20.05, autogenic training group was 18.95 was, and control group was 16. The obtained post-test F value was 43.14 and the required table F value was 3.16, which proved that there was a significant difference among post-test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F value 45.73 was greater than the required value of 3.16, and hence it was

Table 4: ANCOVA results on the effect of yogic practices and autogenic training compared with controls on self-confidence among college kabaddi players

	Yogic practices	Autogenic training	Control group	Source of variance	Sum of squares	df	Mean squares	Obtaine df
Pre-test mean	16.6	16.5	15.8	Between	7.60	2	3.80	1.10
				Within	197.00	57	3.46	
Post-test mean	20.05	18.95	16	Between	175.43	2	87.72	43.14*
				Within	115.90	57	2.03	
Adjusted post-test mean	18.87	19.94	16.19	Between	144.02	2	72.01	45.73*
				Within	88.18	56	1.57	
Mean diff	3.45	2.45	0.20					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df)=3.16, 2 and 56 (df)=3.16. *Significant

Table 5: Multiple comparisons of paired adjusted means and Scheffe's confidence interval test results on self-confidence

Means				Required CI
Yogic practices group	Autogenic training group	Control group	Mean difference	
18.87	19.94		−1.03[&]	1.00
18.87		16.19	2.69*	1.00
	19.94	16.19	3.71*	1.00

*Significant

accepted that there were significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to *post hoc* analysis using Scheffe's confidence interval test. The results were presented in Table 5.

The *post hoc* analysis of obtained ordered adjusted means proved that there were significant differences existed between yogic practices group and control group (MD: 2.69). There was a significant difference between autogenic training group and control group (MD: 3.71). There was a significant difference between treatment groups, namely, yogic practices group and autogenic training group (MD: −1.03).

The ordered adjusted means were presented through a bar diagram for a better understanding of the results of this study in Figure 2.

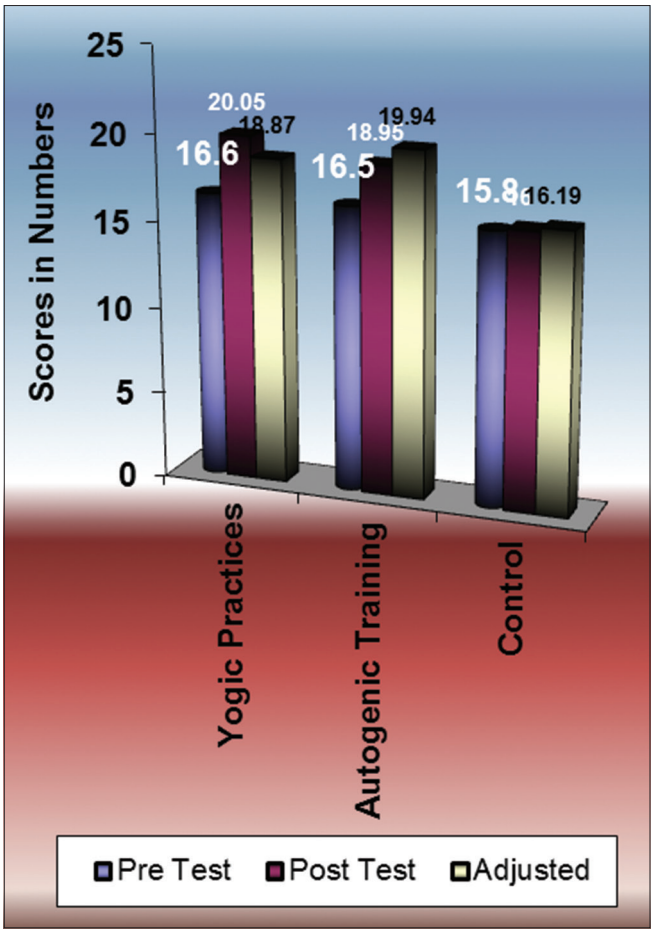

Figure 2: Bar diagram showing pre-test, post-test, and ordered adjusted means on self-confidence

DISCUSSION ON FINDINGS ON SELF-CONFIDENCE

To find out the comparative effect of psychoregulative programs, namely, yogic practices and autogenic training on self-confidence, the obtained pre- and post-test means were subjected to ANCOVA and *post hoc* analysis through Scheffe's confidence interval test.

The effect of yogic practices and autogenic training on self-confidence is presented in Table 4. The analysis of covariance

proved that there was a significant difference between the experimental group and control group as the obtained F value 45.73 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to *post hoc* analysis and the results presented in Table 5 proved that there was a significant difference between yogic practices group and control group (MD: 2.69) and autogenic training group and control group (MD: 3.71). Comparing between the treatment groups, it was found that there was a significant difference between yogic practices and autogenic training group among college kabaddi players.

Thus, it was found that autogenic training was significantly better than yogic practices and control groups in improving the self-confidence of the college kabaddi players.

CONCLUSIONS

Within the limitations and delimitations of the study, the following conclusions were drawn.

1. It was concluded that 12 weeks psychoregulative program, autogenic training, significantly altered the anxiety of kabaddi players compared to the control group. It was also found that there was no significant difference between yogic practices and autogenic training in altering the anxiety level of kabaddi players.
2. It was concluded that 12 weeks psychoregulative program, yogic practices, and autogenic training significantly altered the self-confidence of kabaddi players compared to the control group. It was also found that autogenic training was better than yogic practices in altering the self-confidence of kabaddi players.

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Research Article

Determination of athletics ability from endurance and mean arterial blood pressure of schoolboys

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ABSTRACT

The purpose of the study was a repeated measure research design that was used with athletic ability as the criterion variable and selected physical fitness and physiological variables as the predictor variables. The selected 100 schoolboys who have participated at inter-school athletic meets were measured of their physical fitness variables, endurance, physiological variables, and mean arterial blood pressure. To determine the athletic ability of the subjects, the norms prescribed by the Sports Authority of Andhra Pradesh were used**,** and the scores of the selected tests were converted into standard scores. The obtained data were analyzed using the Pearson correlation coefficient to find out the relationship between athletic ability and selected criterion variables. Multiple **r**egression analyses used to predict the athletic ability of the schoolboys from selected anthropometric, physical fitness, and physiological variables and statically analyzed SPSS PC (version 11.0). In all cases, 0.05 level was fixed.

Keywords: Athletic ability of the schoolboys, Endurance, Mean arterial blood pressure

INTRODUCTION

The method by which athletes are selected for a team can have a significant impact on that team's success. In the past, decisions have been made based largely on judgments of an individual's physical characteristics with little attention given to the psychological factors that contribute to athletic success. Coaches are experts in identifying the physical characteristics needed for success in their field; however, they lack the skills necessary to assess the psychological factors that have been proven to have a significant impact on athletic performance. Coaches have relied on informal judgments of constructs, such as an athlete's motivation and level of aggression to determine their potential to succeed. Everyone has heard stories of athletes that were told they lacked the physical skill to perform, but due to the psychological resources of drive and determination, these individuals have overcome their physical limitations and gone on to be highly productive individuals. The identification, quantification, and implementation of these psychological attributes in selection decisions can, therefore, have a significant impact on a program's success.

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Objectives of the Study

a. The objectives of this study would determine the athletic ability of the schoolboys through selected anthropometric, physical fitness, and physiological variables.
b. In doing so, this investigation would make a present state of schoolboys' anthropometric levels, height, hand span, arm girth and arm length, physical fitness variables, handgrip strength, speed, leg strength, and endurance and physiological variables, vital capacity, resting pulse rate, mean arterial blood pressure, and breath-holding time.
c. Thus, the study would determine an equation based on which athletic ability of schoolboys can be determined.

Statement of the Problem

The purpose of this study was to determination of athletics ability from endurance and mean arterial blood pressure of schoolboys.

Delimitations

The study was delimited in the following ways:

1. This study was confined only 100 to schoolboys in Andhra Pradesh.
2. The subjects selected were in the age group between 13 and 14 years.

3. The variables selected for this study were endurance and endurance and mean arterial blood pressure.

Limitations

This study is limited in the following aspects, and these limitations have to be taken into considerations.

1. The students were from different social, economic, and cultural status which were taken as a limitation for this study.
2. Heredity and environmental factors which contribute to performance have not been controlled.
3. No effect would be made either to control or to assess the quality of the food ingested, lifestyle, effect of metabolic functions as these are recognized as limitations for this study.
4. No other motivational technique was followed to assess selected physical, physiological, and performance variables.

Selection of Variables

The researcher reviewed a number of books, journals, research articles, and coaching manuals and found that athletic ability may have a relationship with selected physical fitness and physiological variables. Based on these observations, the investigator selected the following variables for this study.

Dependent Variable

Athletic ability of schoolboys.

Independent Variables

Endurance and mean arterial blood pressure.

Research Design

A repeated measure research design was used with athletic ability as the criterion variable and selected anthropometric, physical fitness, and physiological variables as the predictor variables. The selected 100 schoolboys who have participated at inter-school athletic meets were measured of their anthropometric variables, height, hand span, arm length, arm girth, physical fitness variables, handgrip strength, speed, leg strength, endurance, physiological variables, mean arterial blood pressure, vital capacity, resting pulse rate, and breath-holding time. To determine the athletic ability of the subjects, the norms prescribed by the Sports Development Authority were used, and the scores of the selected tests were converted into standard scores. The obtained data were analyzed using the Pearson correlation coefficient to find out the relationship between athletic ability and selected criterion variables. Multiple regression analyses used to predict the athletic ability of the schoolboys from selected anthropometric, physical fitness, and physiological variables. In all cases, 0.05 level was fixed.

Criterion Measures

By glancing the literature and in consultation with professional experts, the following measures were applied to collected data on the selected criterion and independent variables.

- Endurance was measured through 600 M Walk test (Yobu, 1988).
- Mean arterial blood pressure was measured by a period of 1 min and recorded in beats per minute. It was measured using a sphygmomanometer and stethoscope (Clarke, 1976).

Table 1 shows the variables selected, the tests and tools used for measurement, and the unit of measurement.

The intraclass correlation coefficient obtained by test and retest method is presented in Table 2.

RESULTS AND DISCUSSIONS

To achieve the purpose of the study, the investigator selected 100 schoolboys from Andhra Pradesh state schools. The subjects selected were in the age group between 13 and 14 years.

In this study, the athletic ability was determined for schoolboys with the help of selected predictor variables such as endurance and mean arterial blood pressure. The athletic ability was determined through the norms prescribed by the Sports Development Authority that was used and the scores of the selected tests were converted into standard scores. The backward selection in multiple regression method was used to determine the prediction equation (Thomas and Nelson, 1990).

COMPUTATION OF DESCRIPTIVE STATISTICS AND RELATIONSHIPS

The descriptive statistics on selected physical fitness variables of subjects are presented in Table 3.

Table 1: The variables, tests/tools, and the measured units

Variables	Test/tools administered	Unit of measurement
Endurance	600 M run	Seconds
Mean arterial blood pressure	Sphygmomanometer	mm/Hg

Table 2: The reliability coefficient of the subjects in anthropometric, physical, and physiological variables by test and retest method

Test items	Coefficient of correlation
Endurance	0.91*
Mean arterial blood pressure	0.89*

Table value r=(0.01) (2.7)=0.735. *Significant at 0.01 level

Table 3: Descriptive statistics on selected physical fitness variables of the subjects

Variables	*n*	Mean±SD	Range
Endurance (s)	100	229.86±21.58	197–206

Table 4: Results on the correlation coefficient between athletic ability and selected physical fitness variables of schoolboys

Athletic ability versus anthropometric variables	*n*	Mean	Obtained "r"	Significance
Endurance (s)	100	229.86	0.204	Sig

Required table "r" value to be significant at 0.05 level with df (1.99) = 0.164 NS: Not significant. Sig.: Significant at 0.05 level

Table 1 shows the mean values, standard deviation, and the range for selected physical fitness variables of the subjects. The mean of the endurance was 229.86 with a standard deviation of ± 21.58.

The correlation coefficient between athletic ability and the selected physical fitness variables was computed through the Pearson correlation coefficient and the results are presented in Table 4.

The results presented in Table 2 showed that there was a significant relationship between athletic ability and endurance 0.204 as the obtained "r" values were greater than the required table "r" value to be significant at 0.05 level.

Table 5 shows the descriptive statistics on selected physiological variables of the subjects.

Table 5 shows the physiological variables of the subjects. The mean of mean arterial blood pressure was 115.69 with a standard deviation of ±4.14.

The correlation coefficient between athletic ability and the selected physiological variables was computed through the Pearson correlation coefficient, and the results are presented in Table 6.

The results presented in Table 6 showed that there was no significant relationship between athletic ability and mean arterial blood pressure (r: 0.117) as the obtained "r" values were lesser than the required table "r" value of 0.164 to be significant at 0.05 level.

Table 7 shows the multiple correlation R, R square, R square change, and the significance of the selected predictor variables by backward selectors.

In Table 7, the selected predictor variables by backward regression method, that is, model I from Table 7, are presented,

Table 5: Descriptive statistics on selected physiological variables of the subjects

Variables	*n*	Mean±SD	Range
Mean arterial blood pressure (mmHg)	100	115.69±4.14	105.5–122.5

Table 6: Results on the correlation coefficient between athletic ability and selected physiological variables of schoolboys

Athletic ability versus psychological variables	N	Mean	Obtained "r"	Significance
Mean arterial blood pressure (mmHg)	100	115.69	0.117	NS

Required table "r" value to be significant at 0.05 level with df (1.99)=0.164. NS: Not significant. Sig.: Significant at 0.05 level

Table 7: Multiple correlations, R square, R square change, and significance of the selected predictor variables by backward selectors

Variables predicted	R	R square	F change	ANOVA "F"	Significance of "F" change
Endurance	0.504	0.254	0677	5.28	0.413

namely, endurance. The multiple correlations R 0.504 with R square value of 0.254, F change of 2.516, and ANOVA "F" of 5.28 with a significant F change of 0.413 are presented in Table 7. The significant F change of 0.413 with the set significance level of 0.10, where all the other variables were removed.

CONCLUSIONS

Within the limitation and delimitation of the present research study, it was concluded that:

1. It was concluded that athletic ability of schoolboys was significantly related with physical fitness variables and endurance.
2. The athletic ability could be best predicted from following variables, namely, endurance.
3. It was concluded that mean arterial blood pressure was not good predictors of the athletic ability of schoolboys. For the above factors, the null hypothesis was accepted.

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Research Article

Role of print and electronic media during pandemic coronavirus disease 19

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ABSTRACT

Coronavirus disease (COVID-19) is an infectious disease caused by a new virus. The disease causes a respiratory illness with symptoms such as a cough, fever, and in more severe cases, difficulty breathing. Print and electronic media are an essential service to the community to give proper information regarding the pandemic COVID-19. The COVID-19 health crisis is dominating the news on a global scale. Print and electronic media recognized as a powerful force to give accurate information to the people living in community all over the world. It helps an individual to take the positive health measures. Print and electronic media will have a positive and negative impact. The positive impact is to take the health measures, physical distancing, use of face mask, and information regarding the use of physical exercises, yoga, meditation, immunity diet, etc. Negative impact by seeing television and reading news the community people sometimes will become anxious, depression, emotional problems, etc. Hence, role of print and electronic media during pandemic COVID-19 play a major role in regulating the disease and post-COVID scenario also.

Keywords: Coronavirus disease 19, Health crisis, Print and electronic media

INTRODUCTION

Coronavirus disease (COVID)-19 is an infectious disease caused by a new virus. The disease causes a respiratory illness with symptoms such as a cough, fever, and in more severe cases, difficulty breathing. Print and electronic media are an essential service to the community to give proper information regarding the pandemic COVID-19.

COVID-19 spreads primarily through contact with an infected person when they cough or sneeze. It also spreads when a person touches a surface or object that has the virus on it, then touches their eyes, nose, or mouth. The "incubation period" means the time between catching the virus and beginning to have symptoms of the disease. Most estimates of the incubation period for COVID-19 range from 1 to 14 days, most commonly around 5 days.

DISCUSSION

Role of electronic and print media to spread the following awareness through newspaper and television.

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Health Measures

Doctors and health professional talk on television and write up in newspapers to reach the public.

To prevent the spread of COVID-19:

- Clean your hands often use soap and water or an alcohol-based hand rub.
- Maintain a safe distance from anyone who is coughing or sneezing.
- Do not touch your eyes, nose, or mouth.
- Cover your nose and mouth with your bent elbow or a tissue when you cough or sneeze.
- Stay home if you feel unwell.
- If you have a fever, a cough, and difficulty breathing, seek medical attention. Call in advance.
- Follow the directions of your local health authority.
- Taking timely medicine by patients of diabetic, hypertension, etc.
- Elderly persons not go out of the home.
- Children below 10 years are not allowed out of home.
- Effective communication for curtailing misinformation.
- Do not self-medication.
- Do not shake hands.
- Do not go to the hospital for routine check-up as far as possible telephonic consultation to the regular family doctor.

- Do not go the crowded places such as markets, religious gatherings, and meetings.
- Postponed the surgeries.
- Wash your hands regularly.
- Do not go near a sick person.

Psychological Measures

Psychologists talk in television and write up in the newspapers for the following psychological problems.

- Anxiety or fear and worry can happen to anyone from time to time, too. It is not unusual to experience anxiety before a big event or important decision.
- However, chronic anxiety can be debilitating and lead to irrational thoughts and fears that interfere with your daily life.
- Feeling fatigued easily.
- Difficulty concentrating or recalling.
- Muscle tension.
- Racing heart.
- Grinding teeth.
- Sleep difficulties, including problems falling asleep and restless, unsatisfying sleep.
- Depression (major depressive disorder) is a common and serious medical illness that negatively affects how you feel, the way you think and how you act.
- Fortunately, it is also treatable. Depression causes feelings of sadness and/or a loss of interest in activities once enjoyed.
- It can lead to a variety of emotional and physical problems and can decrease a person's ability to function at work and at home.
- Feeling sad or having a depressed mood.
- Loss of interest or pleasure in activities once enjoyed.
- Changes in appetite – weight loss or gain unrelated to dieting.
- Trouble sleeping or sleeping too much.
- Loss of energy or increased fatigue.
- Increase in purposeless physical activity (e.g., hand-wringing or pacing).
- Feeling worthless or guilty.
- Difficulty thinking, concentrating, or making decisions.
- Thoughts of death or suicide.
- Strengthening family bonds.
- Domestic conflict and violence.
- Talk video call with friends, relatives, and family members.
- Strategies to deal with social and physical distancing.
- Reduction of stigma, prejudice, discrimination, and inequalities.
- Stay at home.
- Be in the lockdown.
- Plan to utilize time which can make you a better person/student.
- Help the family and parents.
- Help the needy, poor, and migrant labor.
- Learn new skill, English skills, singing, writing skills, etc.
- Avoid meeting visitors at home.

How to Improve the Immunity during COVID-19

There is no medicine for COVID-19 electronic and print media must give news how to improve the immunity. Prevention is better than cure.

Enhancing the body natural defense system plays an important role to maintain good health of the individual.

1. Eating immunity food. Diet rich in antioxidants helps in promoting fighting activities in the body.

Antioxidant-rich foods include:

- Vitamin A and beta-carotene: Pumpkin, squash, carrots, spinach, sweet potatoes, cantaloupes, dark leafy greens, and mangoes.
- Vitamin C: Citrus fruits, strawberries, bell peppers, cauliflower, broccoli, tomatoes, sweet potatoes, and asparagus.
- Vitamin E: Vegetable oil, almonds, whole grains, wheat germ, sweet potatoes, and yams.
- Selenium: Salmon and haddock.
    1. Drinking warm water.
    2. Drinking black tea.
    3. Taking chyavanprash.
    4. Hot milk with haldi.
    5. Fresh lemon juice.
    6. Steam inhalation with pudina.
    7. Eight–ten glasses of water.
    8. Avoid smoking, alcohol, gutka, etc.
    9. Physical exercises, yoga, and meditation.

How to Improve the Immunity during COVID-19 through Physical Exercises, Yoga, and Ayurvedic Diet

The electronic and print media must give full publicity during the COVID-19 how physical exercises helps to improve the immune system in the body.

- Physical exercises such as walking, jogging on spot, and other exercises at home will relieve mental tension, improves blood circulation, and muscle activity.
- Ayurveda, yoga, and meditation have a potential role to engage the community in creating a more positive healthy environment.
- Regular physical activity can also help to give the day a routine and be a way of staying in contact with family and friends.
- Regular physical activity benefits both the body and mind. It can reduce high blood pressure, help manage weight, and reduce the risk of many diseases.
- It also improves bone and muscle strength and increases balance, flexibility, and fitness.

- Warm water is consumed in many parts of India for diverse disorders of fever, inflammation, metabolism, and allergy, such as rhinitis and asthma.
- Regular physical activity also improves mental health and can reduce the risk of depression, cognitive decline, and delay the onset of dementia and improve overall feelings of wellbeing.

CONCLUSIONS

The COVID-19 will create a global health crisis and had a deep impact on the way of every person in daily life.

The COVID-19 will create a global economic crisis and had a deep impact on the way of every person in daily life.

The outbreak of pandemic COVID-19 all over the world has disturbed the political, social, economic, religious, and financial structures of the whole world.

The outbreak of pandemic COVID-19 has created the global sporting crisis postponement of Tokyo Olympics to 2021, IPL Cricket League, and cancellation of many international sporting activities.

The effects of COVID-19 continue to ripple through the world's health, educational, financial, and commercial institutions, and the sports ecosystem is no different.

Social distancing measures, brought in to limit the spread of coronavirus, have had a significant effect on sporting fixtures.

Education of youth and children will be effected.

Online teaching and coaching have increased to maintain the studies, sporting activities, meetings, etc.

Recommendations

Hence, role of print and electronic media during pandemic COVID-19 Plays major role in regulating the disease and post-COVID scenario also. The role of print and electronic media during pandemic COVID-19 plays major role in positive impact of the community.

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Research Article

Study of attitude toward injury in tournament of urban and rural players

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ABSTRACT

The main purpose of the study was to find out the relationship between high, middle, and low athletic identity players of rural and urban players. To find out the attitude of players to ignore the pain and injury during the participation in tournament. For the present study, data were collected from the 500 Inter-university players from two universities, i.e., Sant Gadge Baba Amravati University, Amravati and Rashtrasant Tukadoji Maharaj University, Nagpur. This investigation was conducted employing self-report survey methodology to collect the data the measurement tools used for this investigation contain components. Athletic identity measurement scale developed by Brewer *et al*. (1993). It contains ten statements to which the participants respond based on their agreement or disagreement with each statement summation of scores on the ten items represent the degree to which the individual identifies as an athlete Statistical analysis and interpretation were done on the basis of data collection. Subjects were classified into different categories of low, middle, and high athletic identity. The respondents were male and female belonging to the rural and urban areas. The data collected were statistically analyzed by using critical ratio, mean, SD, *t* - ratio, F-ratio, and correlation method.

Keywords: Athletic identity, Attitude, Injury, Rural, Urban

INTRODUCTION

Sport is a worldwide phenomenon and today, it has become an integral part of man's life. Games are a popular pastime for the young and the old, for boys and girls, and for all to obtain exercise fun and relaxation. They can play an important part in developing physical fitness and developing skill for use in leisure time, now and perhaps more important in later years. Older people who believe in the value of exercising to keep active and healthy participate in the same activity such as tennis, skating, archery, and swimming that they learn at an early age. As sports have developed into a distinct scientific discipline in itself and each nation is vying with each other to produce class players to win laurels in international competition. Considerable research is developing to identify factors that will be predictive of achieving a high level of skill in a given sport with proper coaching.

Sport is a psychosocial activity. It has both psychological and social dimensions, besides physical, physiological, and technical aspects. Man's interest in sports is found in all societies of the world. Most of the nation's share a common interest in sports competition, especially at certain times during the Olympic Games, where people from all nations focus their attention on that drama of competition. However, the quality of the participation of the athletes and sportsmen is determined by their psychological factors. In this modern era of competition, the psychological preparation of a team is as much important as teaching the different skills of game on the scientific lines. The teams are prepared not only to play the games but also to win the games. Moreover, for winning the games, it is not only the proficiency in the skills, which bring victory, but also more important is the spirit of the players, with which they play and perform their best in the competition. The application of psychological principles to the improvement of performance in sports has received greater attention in these days. There are certain accepted psychological principles, which have to be applied so that the athletes and players are able to show their best in their performances. Coaches, physical educationists, and sports scientists have always expressed a great need to know more about those psychological principles, which are helpful in improving the motor skills of the players. It is important to know about the role of reaction time, movement time, and

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emotional phenomena such as competitive anxiety and some personality traits such as extroversion and neuroticism of the players during training as well as competitive situations.[1]

The mind and body controversy seems to have been a concern of philosophers since the days of ancient Greek. Health not in a sense only good physique, but it means not merely the absence of disease. In other words, we can say that the man who has a weak body and weak mind can never be a master of a strong soul. The education is the process by which the individual is shaped to fit into the society and which maintain and advance the social order. It is a systematic process designed to make the man more rational, mature, and knowledgeable. Education is the modification of the behavior of an individual for his own personal happiness and better adjustment in society and making him a successful citizen, contributing something original to society. There are many types of injuries that are possible, but it is important to remember the three most important factors in categorizing injuries: Location, location, location! If that sounds flippant, let's explore a few ideas:

1. First of all, the location (as in the organs involved) of an injury can, of course, determine whether or not it was the fatal injury.
2. Second, the location (as in-depth) of an injury can help determine the severity of the injury and the severity of the crime.
3. Third, the location (as in the location on the victim's body when it was in motion) of an injury can determine the nature of the interaction between the attacker and the victim.

In terms of the organs involved, for example, a gunshot wound need not be fatal. A wound to the chest may provide only a temporary injury, whereas a wound to the arm could be fatal if a major artery is severed. A person may be stabbed multiple times in the back or the abdomen and survive, but a single stab wound to the heart would be fatal.

In terms of depth, some injuries are only to the skin, such as bruising or lacerations, whereas a bruise to the skin can also involve broken bones. A bruise on the temple could crack the cranium, thus leading to bleeding in the brain and death. Depth can thus give a great deal of information about the nature of the crime itself.

Purpose of the Study

The main purpose of the study was to find out the relationship between high, middle, and low athletic identity players toward pain, injury, and help-seeking tendencies. The allied objectives of the study were as follows:

1. To find out the athletic identity of male and female players.
2. To find out the attitude of players toward pain and injury.
3. To find out the help-seeking tendencies for the pain and injury at the time of participation of sports.

1 1ibid, p. 26.

RESEARCH METHODOLOGY

This investigation was conducted employing self-report survey methodology to collect the data the measurement tools used for this investigation contain components.

1. Information, consisting gender of the participate current sports status, age, and brief history of pain and injury.
2. Athletic identity measurement scale developed by Brewer *et al*. (1993). It contains 10 statements to which the participants respond based on their agreement or disagreement with each statement summation of scores on the ten items represent the degree to which the individual identifies as an athlete.
3. Questionnaire on risk, pain, and injury developed by Nixon.
4. The sports inventory for pain was a questionnaire related to athlete's attitude toward pain and injury.

Researcher collected the data for tabulation and statistical analysis of 500 subjects from Sant Gadge Baba Amravati University, Amravati and Rashtrasant Tukadoji Maharaj University, Nagpur of Vidarbha region of Maharashtra.

DISTRIBUTION OF RESPONDENT PLAYERS

In the present investigation, the distribution of respondent players according to their athletic identity category is presented in the following tables.

From Table 1, it is observed that the calculated $t = 8.289$ for degree of freedom 498 is significant at 0.05 level of significance because it is more than the table value 1.96. The mean attitude toward injury score of male players is 32.00 and female players are 28.39. It means that the hypothesis stating that male and female players will differ significantly with respect to their attitude toward injury is accepted. It further shows that there is a significant difference in the attitude toward injury of male and female players.

INFERENCES AND DISCUSSION

From Table 1, it can be inferred that male and female players differ in respect to their attitude toward injury. Attitude toward injury of male players is found better than the female players.

Table 1: Significance of difference between mean attitude toward injury of male and female players

Respondents	*n*	Mean	SD	d.f.	"*t*" value
Male	250	32.00	5.0718	498	8.289*
Female	250	28.39	4.6575		

Tabulated t=1.96, *Significant at 0.05 level

This may be due to their low athletic identity compared to male players.

The same is clearly depicted graphically through Figure 1.

Table 2 shows that the $t = 4.420$ for degree of freedom 498 is significant at 0.05 level of significance because the calculated value is more than the tabulated value 1.96. The mean score of attitude toward injury for rural area players is 31.40 and urban area players are 29.36.

It shows that the hypothesis stating that rural and urban area players will differ significantly with respect to their attitude toward injury is retained. It means that there is a significant difference between the attitude toward injury of rural and urban area players. It also shows that attitude toward injury of rural area players is better than the urban area players.

From Table 2, it is clearly inferred that rural area players have a better attitude toward injury in comparison to their counterpart urban area players. This is also due to the reason that rural players are more tough than urban players; hence, they bear a positive attitude toward injury.

The difference between the mean attitude toward injury of rural and urban area players is graphically presented with the help of the graph in Figure 2.

An examination reveals that the low athletic identity group differs significantly with the middle athletic identity group (MD = 5.70) and high athletic identity group (MD = 11.92). Similarly, the middle athletic identity group differs significantly with high athletic identity group (MD = 6.22), as all the values of mean difference are greater than the critical difference values of 2.21, 2.17, and 0.88, respectively [Table 3].

From the above discussion, it is concluded that the low, middle, and high athletic identity players differ significantly with respect to their attitude toward injury. Furthermore, the players with high athletic identity have a better attitude toward injury than the middle and low athletic identity players.

The mean values are depicted in Figure 3 and the values of mean differences among the groups corresponding to the critical values are graphically represented in Figure 4.

Table 2: Significance of difference between mean attitude toward injury scores of urban and rural area players

Respondents	*n*	Mean	SD	d.f.	"*t*" value
Urban	296	29.36	5.1473	498	4.420*
Rural	204	31.40	5.0187		

Tabulated t=1.96, *Significant at 0.05 level

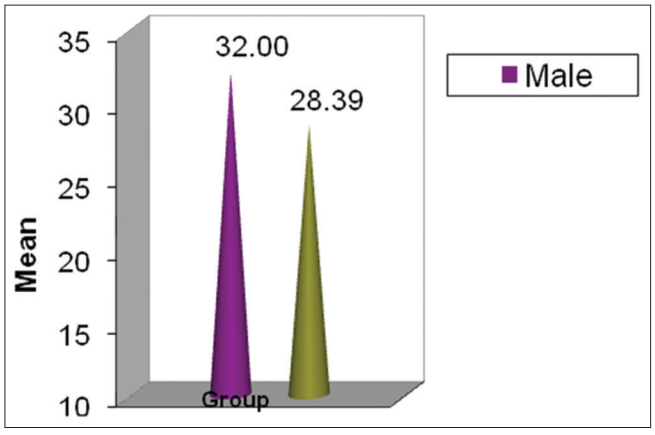

Figure 1: Comparison of mean attitude toward injury scores of male and female players

Findings

1. Maximum 58.20% of respondent players belong to a high level of athletic identity, whereas only 4.00% have a low

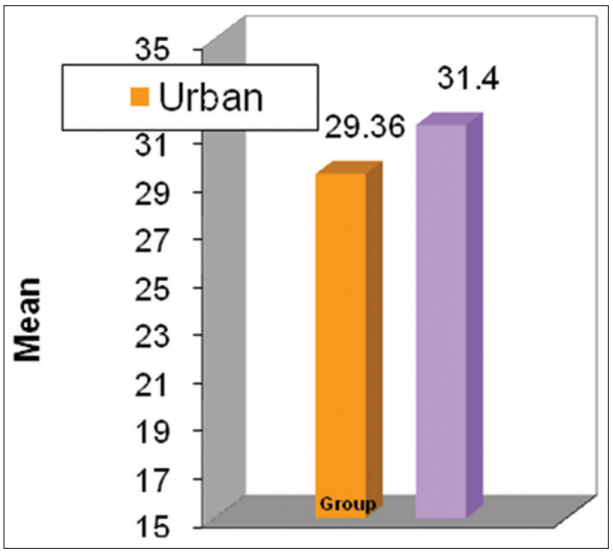

Figure 2: Rural players comparison of mean attitude toward injury scores of urban and rural players

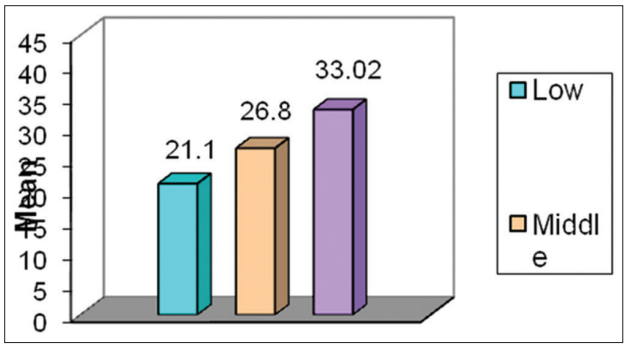

Figure 3: Comparison of means of attitude toward injury among the low, middle, and high athletic identity players

Table 3: Difference between the means of low, middle, and high athletic identity groups in attitude toward injury

Mean of attitude toward injury			Mean difference	Critical difference
Low athletic identity	Middle athletic identity	High athletic identity		
21.10	26.80		5.70*	2.21
21.10		33.02	11.92*	2.17
	26.80	33.02	6.22*	0.88

*Significant at 0.05 level of confidence

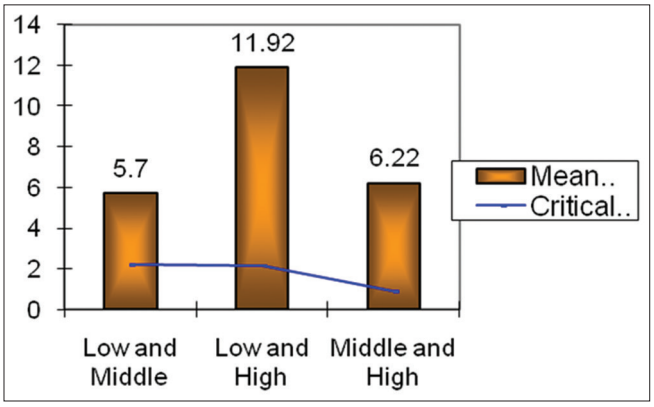

Figure 4: Comparison of mean differences among the low, middle, and high athletic identity players in attitude toward injury along with the critical difference

level of athletic identity followed by 37.80% belonging to the middle level of athletic identity.

2. Of the total 250 male players, a maximum 74.40% and 22.80% belong to the high and middle level of athletic identity, respectively. Only 2.80% of male players belong to a low level of athletic identity.
3. Of the total 250 female players, a maximum 52.80% and 42.00% belong to the middle, and high level of athletic identity, respectively, while rest 5.20% belong to a low level of athletic identity.
4. Of the total rural area players, 69.12% belong to a high level of athletic identity, while 30.39% having a middle level of athletic identity. Only 0.49% showed a low level of athletic identity.

Similarly, 50.68% and 42.90% urban area players belong to the high and middle level of athletic identity, while 6.42% having a low level of athletic identity.

5. Male and female players differed significantly with respect to their athletic identity as the calculated $t = 6.592$ is greater than the table value of 1.96. The mean athletic identity score of male players is 41.20 and female players 36.58.
6. Rural and urban area players differed significantly with respect to their attitude toward injury as the calculated $t = 4.420$ is greater than the table value of 1.96. The mean attitude toward injury score of rural players is 31.40 and urban players 29.36.
7. There is a positive relationship between attitude toward injury and athletic identity of players as calculated $r = 0.773$ is greater than the table value 0.088 at 0.05 level of confidence.

CONCLUSION

1. Most of the respondent players have high to the middle level of athletic identity and very few belong to low-level athletic identity.
2. Most of the male players are having a high level and female players having a middle level of athletic identity. Moreover, the number of players having a low athletic identity is less in both types of players.
3. The percentage of rural area players belonging to the high and middle level of athletic identity is greater than their counterpart urban area players, while the maximum number of players having a low level of athletic identity belongs to an urban area.
4. Male and female players differ significantly with respect to their athletic identity. It can also be inferred that male players have a better athletic identity than female players.
5. Male and female players differed significantly with respect to their attitude toward injury. Attitude toward injury of male players is found better than the female players.
6. There is a significant difference in cope behavior of male and female players. Female players demand more help during stressful events such as experiencing an athletic or exercise-related injury than their counterpart male players.

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Research Article

Repeated sprinting ability performance gain out of training?

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ABSTRACT

The study was ultimately aimed at comparing the effect of resistance training, plyometric, and resistance training plus plyometric exercise on linear speed and repeated sprinting ability (RSA) performance. A completely randomized block design of experimental research was employed so as to compare the effect of 4 weeks resistance training, plyometric training and combined training (resistance + plyometric) on linear speed over 40 m dash and 6*35 m RSA total time performance development. A total of 36 U20 male soccer players participated in the study protocol. The players were assigned in three different treatment groups designated as resistance group (RG), plyometric group (PG), and combined group (CG). Then, the performance gain level for each treatment group was analyzed by comparing the pre-test performance score with the post-test score using paired sample *t*-test and Cohen's d, the Cohen's d value ranges between 0.724 and 7.386. The difference in performance gain level among the three treatment (training) groups was analyzed using one-way ANOA with a subsequent *post hoc* test. Using paired sample t-test, all the three training groups achieved a significant level of performance gain in linear speed and RSA. With one-way ANOVA, it is found that the performance gain level in linear speed among the three groups was significant F (2, 33) = 11.758, $P > 0.001$, $\eta p^2 = 0.416$. The plyometric and CGs achieved a significantly greater speed performance than the RG. However, there was no significant difference among the groups in RSA performance gain. Thus, it was concluded that plyometric exercises are the most effective kind of training to impact speed qualities for soccer players. Using plyometric exercises alone or combining with resistance training is by far better than resistance training alone to improve linear speed or RSA performance with youth soccer players.

Keywords: Plyometric, Repeated sprinting ability, Resistance, Speed, Training

INTRODUCTION

Success in soccer, which can be equated with higher winning rate and being able to be champions with trophy, is the ultimate in today's soccer (Bradley *et al*., 2013). Accounting to their work (method) of training, coaches with the higher winning rate or number of trophies are highly sought by clubs or national teams with huge money deals. The highly commercialized sport, soccer, and attracts big business enterprises (i.e., Medias and companies) because of the expected money gain which is guaranteed for winning teams and clubs. All these, however, rely on the players' level of performance. Thus, the resulting business gain or loss is highly dependent on the players' level of performance (Bangsbo *et al*., 2006). Still performance in contemporary soccer is the result of varied factors or there are numerous performance parameters.

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The psychological make-up (i.e., level of motivation, aggression, confidence, perseverance, and winning mentality), physical fitness (aerobic and anaerobic fitness), and technical-tactical ability are ingredients which enable a player to be capable of playing soccer with its demand and modern essence (Alghannam, 2013; Bradley *et al*., 2013; Durate *et al*., 2012). It is well-established that an optimal level with the required balance among the factors (performance parameters) is too important. For example, though aerobic fitness is necessary to a certain level, anaerobic fitness is the most important and highly sought physical fitness (Barnes *et al*., 2014). Basically, the most frequent anaerobic actions including sprinting, acceleration, jumping, charging, and change of direction accounts only smaller portion of the players activity profile (Barnes *et al*., 2014; Girard *et al*., 2011). However, the most decisive phases or moments of goal scoring or defending highly rely on anaerobic fitness qualities of the players (Faude *et al*., 2012). To this end, the concern of developing and maintaining anaerobic fitness is the ultimate of coaches and strength and conditioning specialists.

Soccer specific anaerobic fitness including linear speed and repeated sprinting ability (RSA) is fitness segments (Gabbett, 2016; Haugen *et al.*, 2014; Nedelec *et al*., Halson *et al*., 2015; Schimpchen *et al.*, 2015), which can be determined by different factors such as genetic make-up (endowed muscle fiber type), maturity (Aughey *et al*., 2016), and training (Bompa and Haff, 2009). In some way, linear speed and RSA are associated or accounted to overall weekly training load. On the other way, the development of soccer related speed quality is connected with soccer specific exercises in the form of small-sided games (Eniseler *et al*., 2017). Other findings reported the most effective method to develop linear speed or RSA is simply by having repeated sprinting exercises (Cipryan *et al*., 2017: Taylor *et al*., 2015).

Strength and conditioning experts recommend there to be resistance training to cultivate speed and performance related fitness qualities for soccer (Ullrich *et al*., 2018). Some other recent findings recommend plyometric exercise for a better adaptive response in terms of speed development (Hammami *et al*., 2016). It is also a common recommendation and approach to have plyometric exercises in the microcycles of the competition period so as to maintain speed and speed-related soccer fitness (Ramirez-Campillo *et al*., 2015). However, regardless of all these, the effect that resistance training had on speed and RSA and plyometric training had on speed or RSA is not compared and studied. Moreover, the effect that a combined training (resistance exercise plus plyometric exercise in each session) had on linear speed and RSA is not clearly known. Thus, a study that compares resistance training, plyometric training, and combined training is worthy of investigation. Therefore, this study was done to show the effect that resistance training and plyometric exercise had on speed or RSA when they are used alone (isolated). In addition, the study aimed at revealing how a combined training regimen of resistance exercise plus plyometric affects speed and RSA. Thus, different training intervention as resistance training, plyometric training, and combined training has been compared against speed and RSA performance improvement. As such it was hypothesized that all these training methods can significantly improve linear speed and RSA without significant differences among.

METHODS

True experimental design has been used for this research. A randomized block design with three treatment groups named as resistance group (RG), plyometric group (PG), and combined group (CG) with a different treatment or training regimen as outlined the procedure section were used. First players were grouped based on their main playing position then randomly assigned into the treatment groups. The players in the common playing positions such as center backs, fullbacks, holding midfielders, outside midfielders, attacking midfielders, and strikers were randomly assigned to the three intervention groups. Thus, the randomization was after grouping of the players as different position players are expected to have a certain fitness qualities which they are believed to be better than other position players. All the players were informed about the purpose and they were volunteer to participate. Comparison of the effect and effect magnitude of each training regimen on performance gains of some selected physical fitness parameters as linear speed over 40 m and RSA total time has been done.

Participants

Thirty-six U20 outfield soccer players' 17 ± 3.212 years of age and 55 ± 3.580 kg of body weight were participants of the study. The researcher has made these trainees the study participant purposely because of convenience, familiarity and they are the one at the age level to have the predisposition for sport specific physical fitness development. All of the participants were informed to have only their team based normal soccer training and the study intervention exercise in their respective group which were both guided by the coach. The soccer specific training was the same for all the groups as the players were from the same team.

Experimental Procedure

Since the ultimate of the study is to compare different exercise/training regimens to improve linear speed and RSA, three different groups for different training intervention were used. In each treatment group, 12 players from each position assigned randomly. The first group was having resistance training for about 4 weeks. For this, the group was designated as RG. The second group, the PG was having plyometric trainings for about 4 weeks in addition to the common soccer specific training. The third group, named the CG, received both resistance and plyometric training combined in each of the intervention sessions. Thus, each group was having their intervention specific training sessions 3 times a week and the same soccer specific training together 3 times a week.

A week before the intervention, each group was assessed in terms of their linear speed and RSA performance the same way they were tested in the post-test. Based on their pre-test result, it was confirmed that there was no any significant difference among the groups in terms of their linear speed and RSA total time performance score. A summary of the intervention training and the training program or protocol employed is outlined here under [Tables 1 and 2].

Testing Methods

40 m dash linear speed was used to test sprinting speed. To test 40 m dash linear sprinting speed, each participant was given three trials and the best time score was taken as a score for analysis. For RSA total time measure, the participants tested using the 6*35 test protocol. This test involves sprinting over

35 m for about 6 times with 30 s recovery time between each sprint. The time in second for each of the six sprint was summed up to get the RSA total time score.

Method of Analysis

Using the Statistical Package for the Social Sciences version 23, paired sample t-test and one-way ANOVA with a *post*

Table 1: The intervention training regimen and exercise prescriptions

Week	RG			PG			CG		
	Exercise	Repetition	Set	Exercise	Repetition	Set	Exercise	Repetition	Set
Week 1	Leg extension	7	3	Jump to box	7	3	Jump t	7	3
	Squat rock	4	3	Tuck jumps	4	3	leg extension	4	3
	Lunge	6	3	Bounding with rings	6	3	Tuck jumps	6	3
	Seated calf raise	6	3	Lateral hurdle jump	6	3	Squat rock	6	3
	Calf raise	8	3	Single leg lateral hops	8	3	Single leg lateral hops	8	3
Week 2	Leg extension	6	3	Jump to box	6	3	Jump to box	6	3
	Squat rock	6	3	Tuck jumps	6	3	Leg extension	6	3
	Lunge	8	4	Bounding with rings	8	4	Bounding with rings	8	4
	Seated calf raise	8	4	Lateral hurdle jump	8	4	Lunge	8	4
	Calf raise	8	4	Single leg lateral hops	8	4	Depth jumps	8	4
Week 3	Leg extension	10	3	Tuck jumps	10	3	Jump to box	10	3
	Squat rock	10	4	Bounding with rings	10	4	Squat rock	10	4
	Lunge	10–12	4	Lateral hurdle jump	10–12	4	Bounding with rings	10–12	4
	Seated calf raise	10–12	4	Single leg lateral hops	10–12	4	Lunge	10–12	4
	Calf raise	10–12	4	Depth jumps	10–12	4	Depth jumps	10–12	4
Week 4	Leg extension	10–12	4	Tuck jumps	10–12	4	Jump to box	10–12	4
	Squat rock	10–12	4	Bounding with rings	10–12	4	Squat rock	10–12	4
	Lunge	10–12	4	Lateral hurdle jump	10–12	4	Single leg lateral hops	10–12	4
	Seated calf raise	10–12	4	Single leg lateral hops	10–12	4	Lunge	10–12	4
	Calf raise	10–12	4	Depth jump	10–12	4	Depth jumps	10–12	4

RG: Resistance group, PG: Plyometric group, CG: Combined group

Table 2: The 4 weeks training program

Day	Week 1	Week 2	Week 3	Week 4
Monday	Normal soccer training	Normal soccer training	Normal soccer training	Normal soccer training
Tuesday	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG
Wednesday	Normal soccer training	Normal soccer training	Normal soccer training	Normal soccer training
Thursday	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG
Friday	Normal soccer training	Normal soccer training	Normal soccer training	Normal soccer training
Saturday	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG	Resistance training for the RG Plyometric training for the PG Combined training for the CG
Sunday	Rest	Rest	Rest	Rest

RG: Resistance group, PG: Plyometric group, CG: Combined group

hoc test were used. After identifying, the significance level in difference, Cohen's d, and partial eta-squared (ηp^2) was used to estimate the effect size of the intervention. For the overall analysis, the critical value was set to be 0.05.

RESULTS

The analysis was made using mean, standard deviation, paired sample t-test, and one-way ANOVA with *post hoc* test. Effect size was also considered using Cohen's and partial eta-squared (ηp^2).

Descriptive Statistics of Pre- and Post-test Score of Speed and RSA (in Seconds)

The descriptive statistics show the performance score of the RSA (6*35 m) total time that each intervention group scored. The RG had a mean value of 41.015 s to the test, while the PG had a mean score of 41.372 in the pre-test [Table 3]. The mean pre-test score of the CG is 40.798 s. Despite the different figures, there was no a significant difference among the three groups in their pre-test performance score (Appendix A). The post-test score however was 39.148, 38.154, and 37.095 s for the RG, PG, and CG, respectively.

In terms of linear sprinting speed over 40 m, 6.155, 6.179, and 6.133 s were taken by the RG, PG, and CG each to cover the distance during the pre-test [Table 3]. With this score, there was no significant difference among the groups (Appendix A), which can be accounted to the methodological approach of employing block randomization. However, the post-test score for the RG, PG, and CG was 5.275, 5.093, and 5.122 s, respectively [Table 3].

The RG achieved a statistically significant performance increment in 40 m dash linear speed, t (11) = 10.309, P < 0.001, ES = 2.976 and in 6*35 m RSA performance t (11) = 2.509, P = 0.029, ES = 0.724 after the intervention training. The PG also achieved a significant linear speed performance gain after the training, t (11) = 16.204, P< 0.001, ES = 4.678. The same way, the PG has a significant RSA performance gain as the pre-post difference is significant, t (11) = 6.298, P < 0.001, ES = 1.818. The CG achieved a significant performance increment in both linear speed, t (11) = 25.586, P < 0.001, ES = 7.386 and RSA, t (11) = 9.710, P < 0.001, ES = 2.803 [Table 4]. In terms of mean difference, the PG achieved the greatest linear speed gain (mean difference is 1.88). In this case, the RG and CG have a mean difference of 0.880 and 1.87, respectively. With that of RSA the PG still had the greatest gain with a mean difference of 3.217 s, when the RG and CG had 1.867 and 0.381 s each [Table 4].

RSA total time measure or performance gain difference is not statistically significant among the three groups of the RG, PG, and CG, though each grouped has showed significant performance improvement after their respective training. However, linear speed performance gain level was significantly different among the three groups F (2, 33) = 11.758, P > 0.001, ηp^2 = 0.416 [Table 5].

After testing the difference in performance gain among the three training methods, *post hoc* test (Benferroni) was used to have multiple comparisons. This way, each group was compared one another pair wise. The mean time taken by the PG to cover the 40 m dash is visibly smaller [Figure 1].

With the *post hoc* result, it is found that the RG linear speed performance gain is significantly lower than both the PG (P < 0.001) and the CG (P = 0.002). However,

Table 3

	RSA total pre			RSA total post			40 m speed pre			40 m speed post		
	RG	PG	CG	RG	PG	CG	RG	PG	CG	RG	PG	CG
Mean	41.015	41.372	40.798	39.148	38.154	37.095	6.155	6.179	6.133	5.275	5.093	5.122
SD	2.548	2.609	2.147	2.730	3.102	1.509	0.247	0.228	0.123	0.137	0.073	0.072
Minimum	38.190	36.700	36.950	36.050	34.420	34.270	5.800	5.920	5.920	5.100	5.000	5.020
Maximum	44.620	44.460	43.630	44.080	44.710	40.240	6.680	6.680	6.330	5.590	5.240	5.230

RG: Resistance group, PG: Plyometric group, CG: Combined group, RSA: Repeated sprinting ability

Table 4: Paired sample t-test comparing the pre-test score with the post-test for each group

Treatment group			*t*	Df	*P*	Mean difference	Cohen's d
RG	RSA pre	RSA post	2.509	11	0.029	1.867	0.724
	40 m speed	40 m speed	10.309	11	<0.001	0.880	2.976
PG	RSA pre	RSA post	6.298	11	<0.001	3.217	1.818
	40 m speed	40 m speed	16.204	11	<0.001	1.087	4.678
CG	RSA pre	RSA post	9.710	11	<0.001	0.381	2.803
	40 m speed	40 m speed	25.586	11	<0.001	0.040	7.386

there is no a significant difference in 40 m linear sprinting speed performance gain between the PG and CG. Thus, the plyometric training group and the combined training group are superior in linear speed gains than the resistance training group [Table 6].

DISCUSSION

The ultimate of the study was identifying the kind of training regimen that can help to get the most out of training based on 40 m linear sprinting speed and 6*35 m RSA performance test score. For this, three intervention groups designated as RG, PG, and CG were used for different intervention and to make subsequent comparison. Therefore, the effect of resistance exercises, plyometric exercises, and the combined training (resistance plus plyometric exercise) on linear speed and RSA were compared.

The study revealed that resistance training, plyometric training, or the combination of resistance, and plyometric training can improve linear speed and RSA performance. Here with this study, it is found that plyometric exercises or the combination of resistance and plyometric exercises in each session can yield a greater linear speed performance increment than resistance exercise alone. This can be accounted to the kind of muscle contraction caused during resistance and plyometric exercise. The speed of movement was not considered in this study. However, speed of movement when doing resistance training is one factor to impact the transfer of strength gained from resistance training to speed performance (Blazevich and Jenkins, 2002). With that of plyometric exercise the movement is inherently fast and explosive using own body weight. This is the kind of muscle contraction too necessary during sprinting. However, with that of resistance training, the focus is on generating the maximum possible contraction repeatedly without a due consideration of speed of movement or rate of force generation. With resistance training, the muscle mostly accustomed to force generation regardless of rate of force generation or explosiveness. On the contrary, plyometric exercises are mainly explosive which is meant there is quick force generation. Thus, explosiveness with force generation can cause the muscle to adapt to the ability of quick force generation, which can help to be speedy enough (Behm *et al*., 2017). Thus, the significant difference in linear speed with the three training regimens is convincing and acceptable.

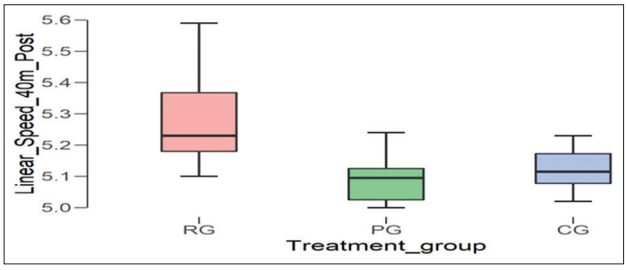

Figure 1: Diagrammatic view of the mean time taken to cover 40 m dash

As a training intervention, the significant performance increment in linear speed and RSA is inherent with all the intervention groups of RG, PG, and CG. Still the existence of non-significant RSA total time performance score among the groups can be accounted to different factors. RSA can rely to other physiological factors as aerobic capacity (da Silva *et*

Table 5: ANOVA result of the three training methods (groups) based on their post-test performance score

Performance measures		Sum of squares	df	Mean square	F	Sig.	ηp^2
RSA total post	Between groups	25.306	2	12.653	1.961	0.157	
	Within groups	212.889	33	6.451			
	Total	238.195	35				
Linear speed 40 m post	Between groups	0.231	2	0.115	11.758	0.000	0.416
	Within groups	0.324	33	0.010			
	Total	0.554	35				

Table 6: *Post hoc* result (multiple comparison) of 40 linear speed post score

(I) Treatment group	(J) Treatment group	Mean difference (I-J)	SE	Sig.	95% Confidence interval	
					Lower bound	Upper bound
RG	PG	0.18250*	0.04043	0.000	0.0805	0.2845
	CG	0.15333*	0.04043	0.002	0.0514	0.2553
PG	RG	−0.18250*	0.04043	0.000	−0.2845	−0.0805
	CG	−0.02917	0.04043	1.000	−0.1311	0.0728
CG	RG	−0.15333*	0.04043	0.002	−0.2553	−0.0514
	PG	0.02917	0.04043	1.000	−0.0728	0.1311

al., 2010) to an extent. The physiologic burden of each bout needs to be counted during the recovery between sprints as it relies on the aerobic capacity of clearing lactate to enable the muscle to produce the required force during the subsequent sprints. However, RSA more relates with anaerobic fitness of strength and explosive power (Kenney *et al*., 2015; Lopez-Segovia *et al*., 2015). Here, it needs to be recalled that all the intervention trainings are mainly anaerobic exercises, which can impact the anaerobic adaptation. Findings in this regard showed that RSA performance measures as RSA mean time and most commonly RSA total time depends on aerobic fitness (da Silva *et al*., 2010) and anaerobic fitness (Dardour *et al*., 2014; Lopez-Segovia *et al*., 2015). Thus, for the performance gain in RSA total time to be low may be the negligence of aerobic fitness development and appropriate training regimens to impact in addition. Future researches on the area can benefit by considering the consideration and acknowledgement of the effect of aerobic capacity on RSA performance or the effect of RSA performance enhancement targeting interventions.

This superior improvement in the RG can be attributed to adaptations such as increases in the thickness, fascicle length, and pennation angle of knee flexor and extensor muscles (Ullrich *et al*., 2018). A number of study findings goes in parallel with this study as plyometric or plyometric plus resistance training can positively affect performance of lower limbs (Ozbar *et al*., 2014; Ramirez-Campillo *et al*., 2018; Ramirez-Campillo *et al*., 2016; Ramirez-Campillo *et al*., 2016; Ullrich *et al*., 2018).

CONCLUSION

Resistance training, plyometric, or combination of resistance and plyometric exercises can significantly improve linear speed and RSA performance level. A 4-week additional trainings of resistance, plyometric, or combination of the two in addition to a normal soccer specific training can significantly improve linear speed and RSA total time performance.

Linear speed over 40 m dash can be improved more by plyometric or combination of plyometric exercise with resistance training than resistance training alone.

RSA performance improvement can be equally developed by resistance training, plyometric exercise or by the combination of resistance and plyometric exercise equally if aerobic fitness improvement is not considered.

Recommendation

When the focus is improvement of pure linear speed, the inclusion and/or addition of plyometric exercises is too important. The inclusion of plyometric training in the preparation period and as well during the competitive period is therefore, ought to be considered. Players who lack linear speed can highly benefit from plyometric training regimen or the addition of plyometric exercises with soccer specific trainings. Youth or promising youngsters who are at a stage with the predisposition to develop linear speed are advised to consider the inclusion of plyometric exercises.

Interventions or trainings which target RSA total time performance need to have plyometric or (combination of plyometric with resistance) trainings with a due consideration of incorporating exercises which can improve aerobic capacity or fitness as well.

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APPENDIX

Appendix A: The ANOVA result comparing the pre-test result of the three groups (RG, PG, and CG)

Performance measures		Sum of squares	df	Mean square	F	Sig.
Linear speed 40 m pre	Between groups	0.013	2	0.006	0.148	0.863
	Within groups	1.409	33	0.043		
	Total	1.422	35			
RSA total pre	Between groups	2.011	2	1.006	0.168	0.846
	Within groups	197.006	33	5.970		
	Total	199.017	35			

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Research Article

Effect of hill running for development of aerobic fitness among badminton players of Osmania University

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ABSTRACT

The objective of this study is to study the effect of hill running in development of aerobic fitness among Badminton players of Osmania University which will be helpful to Coaches and Trainers to develop the endurance ability. The sample for the present study consists of 20 Male Badminton Players of Osmania University out of which 10 are experimental group and 10 are controlled group. Hill running training such as short hills, medium hills, long hills, and mixed hills running were given to experimental group on alternate days for 6 weeks along with general training of badminton and control group were given the general training of Badminton. Pre-test and Post-test were conducted for 12 Min Cooper Test to assess the aerobic fitness of both the groups. This study shows that the experimental group has got rapid improvement due to Hill running compare to control group. It is concluded that due to Hill running there is a improvement of Aerobic fitness. It is recommended that the coaches must include the Hill running programs to badminton players for the development of aerobic fitness.

Keywords: Aerobic fitness, Badminton players, Hill running

INTRODUCTION

Badminton is an extremely demanding sport. At an elite level, players are often required to perform at their limits of speed, agility, flexibility, endurance, and strength. On top of all of this, players must maintain a high state of concentration to meet the tactical/mental demands of dealing with their opponents. The varied potential stresses of competitive play are considerable. It is therefore essential that everyone involved with the modern game ought to be familiar with the fitness (physiological) requirements of the game and how "Badminton fitness" can be enhanced.

Aerobic fitness is essential for Badminton. Aerobic exercise involves the heart and lungs transporting oxygen and food energy to the working muscles. These help to promote recovery from exercise as well as restoring muscle energy supplies for the next bout of activity. A player with good aerobic fitness will be able to play very hard without getting as tired as a less fit opponent. Once a player is tired then mistakes will become more frequent and, as a consequence, aerobic fitness is likely to be closely related to success in long games. Good aerobic fitness is also likely to mean a player can do more training over prolonged periods of time. In this way, aerobic fitness, like strength, underlies all training activities. A common concern about endurance training is that it will cause a player to become slow. This is because continuous endurance training is usually performed at fairly low intensity (i.e., a speed that can be continued for 30 min). A lot of continuous endurance training could certainly detract from speed and agility but appropriate endurance training involved a range of activities and training intensities and should not result in decreased movement speed.

Running on Hills is a form of strength training that can improve the endurance on the track and road. Hill running increases the intensity of training and builds strength because of the resistance they offer when running. Hill running has a strengthening effect as well as boosting the athletes' power and is ideal for athletes who depend on high running speeds. To reduce the possibility of injury hill training should be

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conducted once the athlete has a good solid base of strength and endurance.

Hill Training offers the following benefits.

a. Helps develop power and muscle elasticity.
b. Improves stride frequency and length.
c. Develops coordination, encouraging the proper use of arm action during the driving phase and feet in support phase.
d. Develops control and stabilization as well as improved speed (downhill running)
e. Promotes strength endurance.
f. Develop maximum speed and strength (short hills)
g. Improves lactate tolerance (Mixed hills)

Objectives of the Study

The objective of the study is to determine the effects of the hill running for development of Aerobic fitness among badminton players of Osmania University between the age group of 18 and 25 years.

Purpose of Research

The purpose of the present study to determine the effects of the hill running for development of Aerobic fitness among badminton players of Osmania University between the age group of 18 and 25 years.

Scope of Research

The scope of the research is to determine the effects of the hill running for the development of Aerobic fitness among badminton players of Osmania University between the age group of 18 and 25 years.

REVIEW OF LITERATURE

Nigatu Worku, Dr. Aschenaki Taddese, (2017) studied the effect of 12 weeks hill training on the performance of middle and long distance athletes. The study used a longitudinal and controlled quasi experimental design. To test the hypotheses pre- and post-filed tests were conducted on VO_2 max, Resting heart rate, SE, race performance improvement, consistency of the improved performance, and status of injury. Thirty-two athletes divided randomly into control and experimental group ($n = 32$; 18.8 + 3 years, 51.3 + 5.2 kg, 1.68 + 0.05 m) and passed through 12 weeks of intervention with two session of 40'–60' hill workout a week to the commutative of 16–24 h. During weeks 0, 6, and 12 each subject complete three assessment testes, two records and additional three tests for experimental group at week 16, to assess the consistency of performance. Although the subjects were similar in all aspects before the pre-test was performed; 12 min cooper test (VO_2 max), resting heart rate (mean of three 15 s Rhr. count ×4), speed endurance (300 m anaerobic threshold test), race time records (from 4th to 16th weeks), and injury report records (from 2nd to 12th week) were administrated. The intervention group show significant improvement in VO_2 max, resting heart rate, speed endurance at week 6 ($P = 0.00$, $\alpha = 0.05$) and 12 ($P = 0.00$, $\alpha = 0.05$) and race time but the developed performance at week 16 have showed insignificant change. The control group showed insignificant change at either time points. There were no significant change in injury records between and within groups ($P = 0.381$, $\alpha = 0.05$). The study demonstrated that 12 weeks of hill training can significantly improve VO_2 max, Rhr., speed endurance, and race performance in club level middle and long distance athletes and the developed performance is consistent over 4 weeks period and hill training by itself was not cause of athletic injury. Index terms hill training, VO_2 max, resting heart rate, and speed endurance.

Prof. Rajesh Kumar (2020) studied the effect of Plyometric and Circuit Training on selected Physical Variables among Sprinters of Hyderabad District of Telangana.

METHODOLOGY

The sample for the present study consists of 20 Male Badminton Players of Osmania University between the age group of 18 and 25 years out of which 10 are experimental group and 10 are controlled group. Hill running training such as short hills, medium hills, long hills, and mixed hills running was given to experimental group on alternate days for 6 weeks along with general training of badminton and control group was given the general training of Badminton. Pre-test and post-test were conducted for 12 Min Cooper Test to assess the aerobic fitness of both the groups.

Tools: Cooper 12-min Run Test

The cooper 12 min run is a popular maximal running test of aerobic fitness, in which participants try and cover as much distance as they can in 12 min.

Purpose

The purpose of the study was to test aerobic fitness (the ability of the body to use oxygen to power it while running).

Equipment Required

Flat oval or running track, marker, recording sheets, stop watch.

Procedure

Place markers at set intervals around the track to aid in measuring the completed distance. Participants run for 12 min, and the total distance covered is recorded. Walking is allowed, though the participants must be encouraged to push themselves as hard as they can to maximize the distance covered.

RESULTS AND DISCUSSION

Table 1 shows that the mean values of experimental group in pre-test are 2391.83 and post-test are 2678.50 there is

Table 1: Pre-test and post-test mean values of 12 min run cooper test for badminton players experimental group

Hill training experimental group on cooper test 12 min run						
Badminton players	**Mean**	***n***	**SD**	**SEM**	***t***	**Sig**
Pre_test	2391.83	10	102.57	18.72	−49.091	0.000
Post_test	2678.50	10	109.11	19.92		

Table 2: Pre-test and post-test mean values of 12 min run cooper test for badminton players control group

Hill training control group on cooper test 12 min run						
Badminton players	**Mean**	***n***	**SD**	**SEM**	***t***	**Sig**
Pre-test	2348.33	10	85.29	15.57	5.356	0.000
Post-test	2293.33	10	87.53	15.98		

improvement of mean distance up to 286.67 due to Hill running.

Table 2 shows the mean values of control group in pre-test is 2348.33 and post-test is 2293.33 there is decreasement of mean distance up to 0.55 due to general training.

The strength, speed, and endurance are the important abilities for successful performance. The dominant ability is the one from which the sport requires higher contribution to achieve the high success in the sports and games.

Aerobic fitness plays very important to role in playing the Badminton game for playing efficiently for long period under the conditions of fatigue efficiently. Badminton player having better aerobic fitness can perform better in the match. Hill running also develops strength in legs which is very important to hit the Smashes and also to move in court in higher speed to achieve the good results.

CONCLUSIONS

It is concluded that the due to the Hill running develops the strength and power in the legs. It also improves the coordination in the arms and legs and promotes in developing the Aerobic fitness. In this study, it is concluded that due to the hill running the aerobic fitness develops a lot in the badminton players.

Recommendations

Similar studies can be conducted among females and in other sports and games. This study is useful to the coaches to prepare the conditioning program to improve the motor abilities of the badminton players.

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Research Article

Effect of plyometric exercises for development of speed among basket players of JNTU, Hyderabad

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ABSTRACT

The purpose of the present study is to find out the effect of plyometric exercises on the development of speed among basketball players. The sample for the present study consists of 20 male basketball players of JNTU, Hyderabad, out of which 10 are experimental group, and ten are controlled group. Plyometric exercises such as hopping, bounding, depth jumps, tuck jumps, and pushups were given to the experimental group on alternate days, that is, three sessions per week and the controlled group were given the general training for 6 weeks. Pre-test and post-test were conducted in 30 M run to measure the speed among the experimental group and controlled group. This study shows that due to the plyometric training, there is an improvement of the experimental group in the speed and controlled group is decreased in the performance of speed. It is concluded that due to plyometric exercises, there will be an improvement in speed among basketball players.

Keywords: Bounding, Hopping, Plyometric exercises speed

INTRODUCTION

Plyometrics, also known as "jump training" or "plyos," are exercises based around having muscles exert maximum force in short intervals of time, with the goal of increasing both speed and power. This training focuses on learning to move from a muscle extension to a contraction in a rapid or "explosive" manner, for example, with specialized repeated jumping.

Plyometric drills involve a quick, powerful movement using a pre-stretch or counter-movement that involves the stretch-shortening cycle.[1] Classical plyometric exercises include various types of jump training and upper body drills using medicine balls. Plyometrics are a suitable form of power training for many team and individual sports. While many might see it simply as jumping up and down, there are important guidelines and program design protocols that need to be followed if plyometrics are to be as safe and effective as possible.

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METHODS

Plyometrics are primarily used by athletes, especially martial artists, sprinters, and high jumpers, to improve performance and are used in the fitness field to a much lesser degree. The purpose of the present study is to find out the effect of plyometric exercises on the development of speed among basketball players. The sample for the present study consists of 20 male basketball players of JNTU, Hyderabad, out of which ten are experimental group and ten are controlled group. Plyometric exercises such as hopping, bounding, depth jumps, tuck jumps, and pushups were given to the experimental group on alternate days, that is, three sessions per week and controlled group were given the general training for 6 weeks. Pre-test and post-test were conducted in 30 M run to measure the speed among the experimental group and controlled group.

RESULTS

This results of the study show that due to the plyometric training, there is an improvement of the experimental group in speed and controlled group is decreased the performance speed due to the general training [Table 1].

Table 1: Mean values of 30 M run test between experimental and control groups of basketball players

Variables	Group	Pre-test mean	Post-test mean	*t*	*P*-value
30 M run test	Experimental	4.61	4.20	2.58	0.000
	Control	4.66	4.73		

The experimental group of 30 M run men is 4.61 in pre-test and the controlled group mean is 4.66 in the pre-test. The experimental group mean is 4.20 in post-test and controlled group mean is 4.73, the experimental group mean in post-test in 30 M run is decreased from 4.61 to 4.20, there is a improvement of 0.41 from pre-test to post-test and control group mean is post-test which is 4.73, there is an increase of 4.66 to 4.73 from pre-test to post, the performance is come down to 0.07 in the controlled group. Due to the plyometric training, the experimental group has improved a lot.

CONCLUSION

It is concluded that due to the plyometric training, there is an increase in speed among the basketball players. A plyometric exercise is an exercise, such as jumping, that trains your muscles, nervous system, and connective tissues to effectively complete the stretch-shortening cycle. These exercises are beneficial to performance in athletics, according to the National Strength and Conditioning Association. Basketball players can help increase shooting power, agility, and their ability to rapidly change directions by incorporating both upper and lower body plyometric exercises into their routine.

Recommendations

Similar studies can be conducted on women basketball players and other sports and games. The coaches can prepare the program for the development of speed and other motor qualities in basketball players.

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Research Article

A comparative study on upper body muscle strength among football players and hockey players of Kurnool district

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ABSTRACT

The objective of the study is to determine the comparison of upper body muscle strength among football players and hockey players of Kurnool District. The sample for the present study consists of 20 male football players and 20 hockey players of Kurnool District. To assess, the upper body muscle strength pull-ups test is conducted among football and hockey players. This study shows that due to the hockey players are having more upper body muscle strength compared to football players. Hockey players may have good upper body muscle strength due to the hockey stick; they play using during the game.

Keywords: Football players, Hockey players, Pull-ups, Upper body muscle strength

INTRODUCTION

Physical fitness is one of the most important and key aspects of the field of physical education. However, physical fitness is not the same with health; it plays an essential role in all aspects of health because they are very much related to fitness. Good health provides a solid foundation in which fitness rests and, at the same time, fitness provides one of the important keys to health and living one's life to the fullest. Fitness is not a state for the young; it is a reality for all ages.

Association football, more commonly known as football or soccer, is a team sport played between two teams of eleven players with a spherical ball. It is played by 250 million players in over 200 countries and dependencies, making it the world's most popular sport. The game is played on a rectangular field with a goal at each end. The object of the game is to score by getting the ball into the opposing goal. Players are not allowed to touch the ball with their hands or arms, while it is in play unless they are goalkeepers.

Field hockey is played on gravel, natural grass, or sand-based or water-based artificial turf, with a small, hard ball approximately 73 mm (2.9 in) in diameter. The game is popular among both males and females in many parts of the world, particularly in Europe, Asia, Australia, New Zealand, South Africa, and Argentina. In most countries, the game is played between single-sex sides, although they can be mixed-sex.

The governing body is the 126-member international hockey federation. Men's field hockey has been played at each Summer Olympic Games since 1908 except for 1912 and 1924, while women's field hockey has been played at the Summer Olympic Games since 1980.

Purpose of Research

The purpose of the present study to compare the upper body muscle strength among football players and hockey players of Kurnool District.

Scope of Research

The scope of the research is to identify the upper body muscle strength among football players and hockey players of Kurnool District.

REVIEW

Ajayaghosh (2017), the purpose of this study was to compare the physical fitness variables among intercollegiate level men football and hockey players. To accomplish, the goal of the

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Table 1: Mean values of pull-ups test between football and hockey players

S. No.	Players	Number	Mean	SD	Df	t-value	Sig. (two-tailed)
1	Football	20	8.24	1.22	38	43.109	0.000
2	Hockey	20	12.98	1.30			

current research, 30 intercollegiate football and hockey men players who were active in sports age ranged from 20 to 25 years old randomly selected from the Department of Physical Education, Pondicherry University. They are randomly divided and employed into two equal groups consist of 15 members each, Group – I football players and Group – II hockey players. The subjects were measured by their speed, agility, and lower body strength. It has concluded that football players had better speed, agility, and lower body strength than the hockey players.

Population and Sample Group

Sample of the study

For the present study, 20 male football players and 20 male hockey players have taken for the study between the age group of 18 and 20 years.

S. No	Name of the District	Sample	Total number of subjects
1	Kurnool	Football players: 20 Hockey players: 20	40

METHODOLOGY

For the present study, 20 male football players and 20 male hockey players have taken for the study. To assess, the upper body muscle strength pull-ups test is used in the study.

Pull-Ups Test

The pull-up test is widely used as a measure of upper body strength. Grasp the overhead bar using either an overhand grip with the arms fully extended. The subject then raises the body until the chin clears the top of the bar, then lowers again to a position with the arms fully extended. The pull-ups should be done in a smooth motion. Jerky motion, swinging the body, and kicking or bending the legs is not permitted as many full pull-ups as possible are performed.

Data Collection

The pull-ups test is conducted among male football and hockey players.

RESULTS

The mean values of football players are 8.24, and hockey players are 12.98. The hockey players are having better mean values compare to football players [Table 1].

Research Recommendations

This type of study is useful for coaches to give proper coaching for the development of motor qualities for improvement of performance in football and hockey.

Recommendations for Further Research

It is recommended that similar studies can be conducted on other sports and games and also female footballers and hockey players.

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Research Article

Study on cardiovascular efficiency of west Bengal females: Find out the relationship in respect of physical fitness components

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ABSTRACT

The present study was to find out the relationship between cardiovascular efficiency and different physical fitness components on females belongs to sedentary, active, and state level performers. To achieve the purpose of the study, 45 females of 22–25 years were selected as the subjects and each group was comprised 15 volunteers. The sedentary females selected from Kalyani Mahavidyalaya and active females from B. P. Ed Course under the University of Kalyani, Nadia. Similarly, the state level performers were selected from the overall West Bengal who had participated in different State Athletic Championships. The measurement of cardiovascular efficiency by Harvard Step Test and physical fitness includes five items of AAHPERD Test excluding the chin-up. Mean and standard deviation were calculated as descriptive statistics and to find out the relationship between two groups the coefficient of correlation was conducted. The performance of speed, endurance, agility, and abdominal muscular strength was significantly different among three groups. However, there is no significantly difference between the physical efficiency index and few numbers of physical fitness components. From the results, it can be concluded that the health related fitness of general females was similar to other groups in the West Bengal.

Keywords: Cardiovascular efficiency, Harvard step test, Health related fitness and West Bengal, Physical fitness index

INTRODUCTION

The cardiovascular efficiency generally refers to as the efficiency with which the human body can distribute blood and oxygen. The human being represents a unified whole, each part being necessary to the successful functioning of every other part. The heart is the typical cardiac tissues play the key role in steering the supply of blood throughout the body. The capacity of a normal heart differs from the capacity of a trained heart of an athlete. The changes in the size elicit change in functional capacity of an individual. It is a measure of the performance capacity of circulatory system. The improvement of cardiovascular efficiency denotes the improvement of greater vascularize in different tissues along with the changes in the components of blood specially the number of cells, the composition of plasma and the contents of red blood corpuscle. Cardiac efficiency is normally about 20–25% and the remainder of the oxygen used is converted to heat (Veldenten *et al*., 1982). Work and efficiency depend on the load and the heart. It was shown that the heart under control resting conditions pumps at these maxima (Toorop, 1988).

From a health perspective, people who have good heart and lung endurance can exercise longer, not get tired as quickly, and avoid all kinds of cardiorespiratory diseases. Improving cardiorespiratory endurance is an important issue for maintaining good health (Ricardo *et al*., 2016; Aertssen *et al.*, 2018 and Melissade *et al.*, 2018). Bucher and Prentice (1985) defined physical fitness as the capacity of the heart, lungs, blood vessels, and muscles to function at optimal efficiency. The fit individual is able to complete the normal routine for the day and still have ample reserve energy to meet the other demands of daily recreational sports, rewarding relationships, and other leisure activities.

Vashist and Singh Pal (2015) studied on the influence of height on cardiovascular efficiency computed using Harvard step test. Their evident was the performance of the taller group which

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is significantly better than the shorter group in cardiovascular efficiency index. Shoebuddin and Daimi (2019) found that PFI scores between two groups of non-obese and obese group, (18–25) the value of Chi-square was found to be 28.78 with DF = 3 and $P < 0.0001$ which is extremely significant. They also concluded that the PFI scores to be much better in subjects who had less body fat percentage.

In the light of all above-mentioned background research scholar generally felt the research needed to be conducted to objectively find out the relationship between cardiovascular efficiency and physical efficiency index and selected fitness components in West Bengal females.

METHODOLOGY

The subjects of the present study, total 45 females within the range between 22 and 25 years were selected from the West Bengal. According to the design of the study, there were three different sub-groups, namely, Sedentary Students (Non-athlete), Active Students (B. P. Ed.), and State level performers. The sedentary females selected from Kalyani Mahavidyalaya and active students selected from boarder of ladies hostel-I under the University of Kalyani, Nadia. The state level performers were taken from different district of West Bengal who had participated in the different state level championship especially in athletics.

In this study, two criteria were measured for related tests such as cardiovascular efficiency and physical fitness components separately for sedentary, active, and state level performers. For each subject was performed, five items of AAHPERD Test such as 50 yard dash in second, 600 yard dash in second, shuttle run in second, standing broad jump in centimeters, one minute's sit-up in numbers excepting the chin-up and estimation of physical efficiency index was administered by Harvard step test.

Mean and standard deviation were calculated as descriptive statistics and to find out the relationship between two groups the coefficient of correlation was conducted.

RESULTS AND DISCUSSION

The personal data of the subjects mainly the age, height, and weight are presented in Table 1. The mean age of the active group was slightly higher than the other two groups. However, the mean height and body weight of the state level performers were higher than the other two groups. It may be considered that the difference in mean body weight of the state level performers is due to greater height.

All the scores of physical fitness components, namely, speed (50 yard dash in see.), endurance (600 yard dash in see.), leg explosive power (standing broad jump in cm.), agility (shuttle run in sec.), and abdomen muscle strength (sit-ups in No./Min.) of the three separated groups are presented in Table 2. The state level group was better performance than the other two groups. The sedentary group obviously was lower among the three groups. Active group occupied the middle position between the higher and lower scores, but the performance in agility was higher than the sedentary and state level performers.

The efficiency of heart to eject greater amount of blood is known as cardiovascular efficiency. The relationship of PFI with speed, endurance, explosive leg power, agility, and abdomen muscle strength of sedentary group was −0.079, −0.042, 0.260, −0.308, and 0.053, respectively. However, all the coefficients of correlations were not significant at any level of confidence through some relationships were negative and some positive. Relationship of PEI with all the physical components of active group was 0.095, −0.042, −0.348, 0.368, and −0.279, respectively. All the coefficients of correlations were not significant at any level of confidence though four relationships were negative and two were positive. Similarly, the relationship between PFI and the selected physical fitness components of state level group was 0.038, −0.505, 0.364, 0.207, and 0.365, respectively. Here, all the coefficients of correlations were not significant at any level of confidence though five were positive and only one negative [Table 3].

The correlation between the variables which were obtained in this study, majority of them were negative none were significant. Therefore, from the "r" values obtained and analyzing the correlations it may be concluded that while the scores of the variables were obtained many other factors probably influenced the results which were neither controlled nor included in this study. Hence, further study may be conducted in this regard.

According to Araujo (2013), adequate supplement and maximum utilization of supplied oxygen would enable person to work efficiently for long. For better physical work performance, there are numbers of cardiorespiratory adjustments being made by the body such as increase respiratory rate, oxygen uptake, heart rate, cardiac output, and importantly marked increase in utilization of available oxygen by the cells. Madureira *et al*. (2009) found that approximately 68% of college students are considered inactive and women presented a significantly higher prevalence of physical inactivity when compared to men. This behavior, added to the advent of technology, leads to an even greater level of sedentary for this population (Wang, 2013). However, when it comes to college students with health-related majors, it is expected that the knowledge acquired during college regarding risk factors related to low physical fitness positively influences a healthy lifestyle.

Sengupta and Sahoo (2011) studied that infers fishermen (mean age 22.4) have more physical fitness (cardiovascular fitness),

Table 1: Mean score, SD, and Range of personal data of three groups

Groups	Variables	Age (Years)	Height (cm)	Weight (kg)
Sedentary group	Mean±SD	23.07±0.70	152.95±4.17	47.07±6.91
	Range	22.25	144.5–161.0	40.0–67.5
Active group	Mean±SD	23.60±1.12	154.95±3.68	48.80±5.17
	Range	22–25	150.0–161.1	42.0–56.5
State level performer	Mean±SD	23.07±1.10	159.57±8.28	51.87±7.95
	Range	22–25	145.3–169.2	42.0–68.5

Table 2: Mean and SD of different PFC of the three groups

Groups	Variables	50 Yard dash (s)	600 Yard dash (s)	Standing broad jump (cm)	Shuttle run (s)	Sit-ups (no.)
Sedentary group	Mean±SD	9.00±0.39	208.14±24.79	151.07±16.30	26.85±1.18	21.67±3.98
Active group	Mean±SD	7.68±0.51	151.25±15.96	199.40±15.51	21.97±1.12	33.2±5.86
State level performer	Mean±SD	7.32±0.71	130.34±19.52	203.4±21.18	21.04±0.88	41.53±5.89

Table 3: Coefficient of correlation between PEI and physical fitness components

Groups	Speed	Endurance	Explosive leg power	Agility	Abdomen muscle strength
Sedentary group	−0.079	−0.042	0.260	−308	0.053
Active group	0.095	−0.042	−0.348	0.368	−0.279
State level performer	0.038	−0.505	0.364	0.207	0.365

When n=15, required "r" value to be significant at 0.05 level was 0.514

muscle mass, and less fat percentage than sedentary population. But with physical strength and cardiovascular fitness more endurance are required for better health of young fishermen. Sinku (2012) showed that a statistically significant difference of cardiovascular fitness ($t = 49.61$, $P < 05$) between rural and urban collegiate students. Awati and Malipatil (2017) revealed that there was a significant change in the cardiovascular efficiency of high school girl cricket players. Bagade *et al*. (2015) indicated that a deteriorated cardiovascular efficiency in the overweight subjects as compared to normal, i.e., the PFI scores were much better in normal weight subjects as compared to overweight subjects.

CONCLUSIONS

Within the limitation of the present study on the basis of results and discussions following conclusion may be drawn:

1. On personal data
   The ages of the three groups are approximately equal but the height and weight are different.
2. On physical fitness components
   In speed, endurance, agility, and abdomen muscle strength are significantly different among the sedentary, active, and state level group. However, there is no significantly different between the state level and active group in leg explosive strength.
3. Relationship between PEI and PF components of the three group
   There is no significant relationship between PEI and PF components.

Recommendation

Considering the various aspects the author recommended that the present study has been confined within the 22–25 year's age group. Further study may be conducted to various team and individual games.

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Review Article

Effect of Plyometric Exercises for the Development of Explosive Power in Legs among Weight Lifters of Nizamabad District in Telangana

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ABSTRACT

The objective of the study is to determine the effect of plyometric exercises for the development of explosive power in legs among weight lifters of Nizamabad District between the age group of 21 and 24 years. The sample for the present study consists of 20 male weight lifters of different weight categories of Nizamabad District, of which ten are experimental group and ten are controlled group. Plyometric exercises training were given to the experimental group along with general weight lifting training and control group has doing general weight training for 6 weeks. To assess the explosive power in legs standing broad jump test were used in the pre-test and post-test of the study. This study shows that the experiment group increase the explosive power compare to the control group. It is concluded that due to plyometric exercises there is an improvement of explosive power among weight lifters.

Keywords: Explosive power, Plyometric exercises, Standing broad jump, Weight lifters

INTRODUCTION

Plyometrics, also known as "jump training" or "plyos," are exercises based around having muscles exert maximum force in short intervals of time, with the goal of increasing both speed and power. This training focuses on learning to move from a muscle extension to a contraction in a rapid or "explosive" manner, for example, with specialized repeated jumping.

Plyometric drills involve a quick, powerful movement using a pre-stretch or counter-movement that involves the stretch shortening cycle.[1] Classical plyometric exercises include various types of jump training and upper body drills using medicine balls. Plyometrics is a suitable form of power training for many team and individual sports. While many might see it simply as jumping up and down, there are important guidelines and program design protocols that need to be followed if plyometrics are to be as safe and effective as possible

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Kumar (2020) studied about the effect of plyometric and circuit training on selected physical variables among sprinters of Hyderabad District of Telangana State. To achieve this purpose, 45 sprinters in the age group of 16–20 years those who have participated in the Hyderabad open sprints athletics championships at Gachibowli stadium, Hyderabad for the year 2019 taken as subjects.

PURPOSE OF RESEARCH

The purpose of the research is to determine the effect of plyometric exercises for the development of explosive power in legs among weight lifters of Nizamabad District between the age group of 21 and 24 years.

SCOPE OF RESEARCH

The scope of the research is to determine the effect of plyometric exercises for the development of explosive power in legs among weight lifters of Nizamabad District between the age group of 21 and 24 years.

POPULATION AND SAMPLE GROUP

Sample of the study:
For the present study, 20 male weight lifters have taken for the study between the age group of 21 and 24 years of Nizamabad District.

Name of the district	Sample	Total number of subjects
Nizamabad	Weight lifters exp. Group-10	20
	Weight lifters control Group-10	

METHODOLOGY

Plyometric exercises such as hopping, bounding, depth jumps, tuck jumps, and pushups were given to the experimental group on alternate days, i.e., three sessions per week and controlled group were given the general training for 6 weeks. Pre-test and post-test were conducted in standing broad jump to measure the explosive power among experimental group and controlled group.

EXPERIMENTAL GROUP: 1: PLYOMETRIC TRAINING

Table 1: Test description of week 1 and week 6 training intensity up to 60–100%

Day	Name of the exercises	Repetitions and sets
Monday	Hopping, bounding, multiple hops and jumps	30 M×3 reps×3 sets
Wednesday	depth jumps, box jumps, box drills	10 Jumps×3 reps×3 sets
Friday	Standing broad jumps, squat jumps Alternate leg boundings	10 Jumps×3 reps×3 sets 30 M×3 reps×3 sets

RESULTS AND DISCUSSION

The independent samples t-test statistics is applied for the study. The comparison was made among experimental group and control group in pre-test and post-test mean.

Table 2: The mean values and independent samples test of standing broad jump between experimental and control groups of weight lifters

Variables	Group	Pre-test Mean±SD	Post-test Mean±SD	*t*	*P*-value
Standing broad jump	Experimental	2.30±0.157	2.42±0.185	3.55	0.001
	Control	2.26±0.159	2.22±0.161		

*Significant at 0.05 level

In Table 2, the mean values of experimental group of weight lifters in pre-test are 2.30 and control group weight lifters are 2.26. Due to plyometric training, the experimental group has increased that the mean values in post-test are 2.42 and due to general training the control group has decreased from 2.26 to 2.22 the results of the study shows that experimental group of weight lifters has increased in the performance of standing broad jump.

CONCLUSION

It is concluded that due to plyometric training there will be improvement in explosive power among weight lifters. In this study, due to the plyometrics exercises there is an improvement in explosiver power of legs of weight lifters.

RECOMMENDATIONS

It is recommended that similar studies can be conducted on other events in other events and also female weight lifting. This type of study is useful to coaches to give proper coaching for development of motor qualities for improvement of performance in weight lifting.

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Conferences and Webinars

PROMOTED BY: INTERNATIONAL FEDERATION OF PHYSICAL EDUCATION, FITNESS AND SPORTS SCIENCE ASSOCIATION

1. **International Conference on Enhancing Skills in Physical Education and Sport Science 2020 to be held at Osmania University, Hyderabad, T.S. India is postponed due to Covid 19 Pandemic. The New dates will be announced after the Govt. of India order. Please Click for Proceedings. ICESPE_2020 Final**
2. **Online International Seminar and Workshop – on Concepts of Physical Education and Sports Sciences on 25th May -28th May organized by Sri Shivaji College of Physical Education, Amravati, INDIA.**
3. **International Webinar on Sports Science held on 20th May 2020 organized by St.Francis College for Women, Hyderabad, T.S. India**
4. **International Webinar on New Horizons in Physical Education and held on 28th May 2020 organized by Villa Marie Degree College for Women, Hyderabad, T.S. India**
5. **Two Day International Webinar on Research in Physical Education and Sports held on 6th and 7th June 2020 organized by Anurag University, Hyderabad.**
6. **National Webinar on Health and Wellness Management for Quality of life in Covid-19 organized by Azaan Group of Institutions on 7th June 2020.**
7. **International Webinar on Physical Education, Sports and Fitness in embarrassing the New Normal held on 8th June 2020 Organized by Cebu Normal University, Philippines.**
8. **International Webinar on Cybernetics & Sports Performance in Current Scenario :- with Special Reference to Covid-19 Pandemic organized by Shri Shankaracharya Mahavidyalaya, Junwani, Bhilai, Chattisgarh on 9th June 2020.**
9. **Online Faculty Development Programme on Physical Education and Sports Organized by Little Flower Degree College from 15th to 17th June 2020.**
10. **International Webinar on Physical Literacy, Yoga and Sports Science organized by Dept. of Physical Education, Govt. Model Degree College, Mahanpur, Kathua UT of J& K on 21st June 2020.**
11. **International Webinar on Exploring New Possiblities during Covid – 19 organized by Shri Shankaracharya Mahavidyalay, Junwarni, Bhilai, Dist. Durg, Chattisgarh on 27th June 2020**
12. **International Webinar on Sports Medicine on 28th June 2020**