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Research Article

Exploring traditional games through a fitness perspective

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ABSTRACT

Since ancient times, Indian games have been an amalgamation of cultural legacy and physical exertion, providing affordable solutions to promote health and sports performance. This study was carried out at JSS Public School, Mysore (Karnataka, India) to evaluate the effect of traditional games on agility, speed, flexibility, and muscular power in school children. A 6-week intervention with games, such as Kho-Kho, Kabaddi, Hopscotch, and Lagori integrated with wearables Inertial Movement Units was carried out with 60 students (11–15 years of age) randomized to experimental or control groups. The experimental group obtained an increase in agility (5.4%), leg power (3.5%), flexibility (6.0%), and sprinting velocity (5.5%), with no changes in the control group. This culturally appropriate and technologically enabled approach is scalable as a model for Indian schools, in synchronization with the national initiatives, such as the Fit India Movement.

Keywords: Agility and coordination, Fit India movement, Traditional Indian games, Wearable inertial movement units sensors

INTRODUCTION

There is a rapid global rise of the sedentary nature of children and young people, and these trends lead the bottom-line of urgent public health issues. The decline of physical activity is strongly linked to various long-term health problems, such as obesity, heart diseases, diabetes, musculoskeletal problems, and low motor skills expertise.[1] Children and adolescents are recommended to be involved in a minimum of 60 min/day of moderate to vigorous physical activity for activating good health according to the World Health Organization (WHO) guidelines.[2] However, this traditional form of outdoor play is on the decrease due to modern trends of screen-oriented entertainment, digital/online gaming, and academic pressure, among others, curtailing the child's free play time severely, diminishing its significance in a child's day.

The impact of physical inactivity on physical literacy, social mastery, and general well-being increases. This trend underscores a pressing call for culturally appropriate, low-cost, and enjoyable interventions that can challenge the inactivity trend and reintroduce active play in young people's daily schedules.

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Role of Traditional Games in Modern Context

For centuries, conventional games have been deeply rooted in the historical and cultural fabric of various civilizations, helping communities in bridging the gap, maintaining physical and mental health, coordination, and developing sports skills. Games, such as Kho Kho, Kabaddi, Lagori, Hopscotch, and Pagade, not only add fun, but also promote zigzagging, and multidirectional earthly movements, which in turn stimulate to acquire dynamic multiplanar movement skills to improve agility, muscular endurance, and coordination.[3] These games involve instinctual components of running, dodging, jumping, and hitting, skills necessary in sporting play as well as in many daily physical activities.

In contrast to organized gym-focused exercise programs, informal games are infrastructure-light (you only need space to for the activity) that may have better potential for under-resourced schools and rural areas.[4] Moreover, these interactions encourage social integration, cultural understanding, and the sense of belonging as well as teamwork, leadership, and decision-making.[5]

Physical and Cognitive Benefits

In addition to contributing to physical well-being, traditional games contribute to cognitive and psychosocial development. They engage strategic planning, problem-solving, memory retrieval, and instantaneous choice-making, all of which help promote better executive function and academic achievement.

The social interaction that is incorporated into these games, can promote emotional regulation, empathy, and conflict resolution, to promote a more well-rounded method to promote development.[6]

Physiologically, the multidirectional movements, sprinting, and bodyweight resistance involved in these games can easily replace your workout when you can't always make it to the gym. These actions enhance motor coordination, promote activation of the cardiorespiratory complex, and assist in motor skill development similar to, or at times greater than, those experienced in routine PE routines.[7]

Notwithstanding ample support that traditional games are effective physical activity interventions, there are three limitations in the literature.

Reliance on observation-based technique

A majority of the previous researches rely on self-report,[6,7] subjective perception,[6,7] causing a reduction in reliability, reproduction.

Lack of quantitative analyses

There are a limited number of studies that use validated fitness tests or quantitative performance outcomes to determine if agility, speed, and coordination improves.

Low level of use of technology

Wearable devices, motion sensors, and digital displays of results for real-time data acquisition and personalized feedback are poorly integrated.

To fill in these gaps, our study presents an evidence-based framework, integrating traditional games and technology-enabled performance monitoring. This methodology enables an objective quantification of enhancements, while remaining faithful to the original social and cultural context of these games.

Statement of the Problem

Physical inactivity in Indian school children is increasing, which is compounded by the growing semi-urban areas, such as Mysore. Academic pressure and digital entertainment have rendered outdoor play as extinct.[1] Fewer than 30% of children match the WHO's 60-min daily activity target.[2] Schools lack cost-effective fitness programs. Traditional games, erstwhile favorites in India, lie forgotten, even though these can enhance physical literacy.

Objectives of the Study

- Evaluate traditional games on flexibility, agility, speed, and muscular power
- Incorporate wearable Inertial Movement Unit (IMU) technology for data precision
- Contrast traditional games with typical PE routine.

Significance of the Study

The study offers an affordable and culturally relevant remedy for India's fitness crisis, in line with the WHO recommendations and India's Fit India Movement. It is the possibility to merge heritage and digital innovation.

Limitations of the Study

- Duration limited to 6 weeks.
- Conducted in one Mysore school.
- Small sample size (n=60).

Delimitations of the Study

- Students aged 11–15 years only.
- Focused on four games: Kho-Kho, Kabaddi, Hopscotch, and Lagori.
- Measured agility, flexibility, speed, and power.

Hypothesis

- H_1: Traditional game group shows significant improvements.

Scope of the Study

Focuses on the Mysore school context, scalable across India, with policy implications for CBSE/State boards.

Definitions of Terms

1 Agility: Ability to change direction quickly
2 IMU sensor: Tracks acceleration and angular velocity
3 Traditional games: Indigenous games requiring physical activity.

REVIEW OF LITERATURE

Role of Traditional Games in Physical Fitness

Traditional games are widely seen as cultural heritage, but the possibility that they can contribute to physical training and athletic performance has only been examined in a systematic way during recent years. Unlike repetitive, unidirectional, gym-based exercises, active games can engage youth in effortful, multidirectional movements that target most of the muscular groups and assist with cardiovascular fitness. Like taekwondo scuffles, these games require running, ducking, balance, and snap reflexes, all of which combine to create agility, flexibility, and muscles with snap.

Munir[9] conducted an experimental study comparing the traditional game structure with a standard physical education (PE) functional routine. They found that people who played old-fashioned games were more agile and had better leg strength, important qualities on the field. Notably, agility scores increased by 7.2% and vertical jump performance by 3.8%, demonstrating the functional nature of game-based physical activities in comparison with isolated exercise drills.

Table 1: Percentile changes of study variables in pre-test and post-test among experimental and control group

Parameter	Experimental pre	Experimental post	Percentage change (experience)	Control pre	Control post	Percentage change (control)
50 m sprint (s)	8.2	7.75	5.50	8.18	8.15	0.40
Vertical jump (cm)	38.1	39.4	3.50	38	38.2	0.50
Flexibility (cm)	22.5	24	6.00	22.4	22.5	0.40
Agility (s)	12.8	12.1	5.40	12.9	12.8	0.80

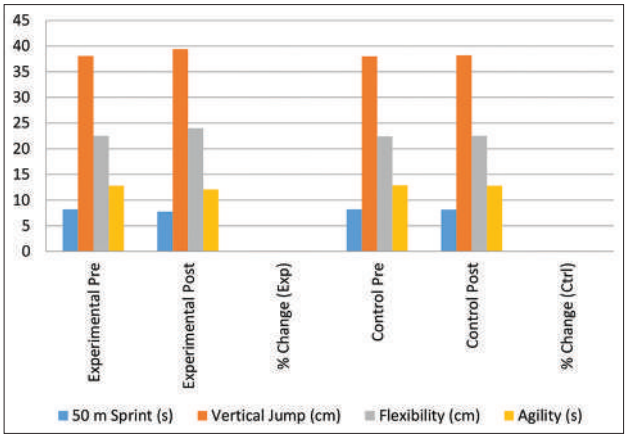

Figure 1: Performance comparison. Paired *t*-test: Significant improvement in experimental group ($P < 0.01$ for all variables). Analysis of variance: Between-group differences statistically significant ($P < 0.05$)

Annadurai and Kuppusamy[10] also highlighted sex-specific advantages, demonstrating that adolescent girls' 50-m sprint time significantly enhanced after attending 6-week indigenous games program. This indicates that culture games could also be designed to target various performance indices such as speed, reaction time, and so on.

Awang Irawan *et al*.[11] they studied in early childhood development and found that traditional games support basic motor skills, that is, hopping, skipping, and running. A 50% shift from undeveloped to well-developed level of motor skills revealed the capacity of traditional games to be flexible to different age groups and the potential of being integrated into early childhood education.

Compared with contemporary structured sports, traditional games have a practical advantage in being inexpensive to produce, low in equipment costing, and embodied in local culture, and thus are scalable in less developed countries and resource-limited schools. These outcomes, together, support the view that traditional games are feasible, suitable, and sustainable fitness activities.

Cognitive and Social Benefits

It also describes the other benefits of traditional games not only on the physical aspect, but also on cognitive development and socio-emotional well-being. Such games are games of strategy and require memory and efforts of adapting; therefore, the games also stimulate executive function and problem-solving.[12] For example, team sports, such as Koh-Kho or Kabaddi, for instance, allow for constant situational awareness and on-the-go thinking, which can translate to academic and life skills.

Classic games also provide great social skills experiences, as they are all based around teamwork, leadership, and conflict resolution.[13] In ethnocentric education patterns, such games facilitate cultural inclusion and are participated in by students belonging to different cultural groups. In addition, traditional games that children play can play an important role on anxiety and emotional regulation, enhancing this way the general health of the child.[12]

Including these games in school curricula not only improve motor skills but also create appropriate class dynamics, turning learning into an entertaining and socially rewarding task.

Integration with Technology

Where traditional games are decidedly low-tech, the increasing merging of PE with the digital makes for new ways to assess and engage. Internet of things (IoT)-based devices, wearables, and artificial intelligence (AI)-led dashboards are being employed in sports and PE curriculums to measure real-time sport performance metrics, including speed, agility, and energy expenditure.[14]

Wicahyani *et al*.[15] developed a digital tracking system combining sensor-based data logging and cloud-based dashboards to monitor students' activities while playing cultural games. This immediate feedback system gives teachers the ability to proportion intensity and challenge for a personalized and progressive fitness setting.

Global health campaigns have similarly emphasized the importance of technology-based health interventions in addressing sedentary behaviors.[16] Motion analysis at the micro-level is provided by wearable technologies, such as accelerometers and IMUs, for a quantitative assessment of the effectiveness of classical exercises.[17] These instruments support analysis, but there is a clear need to take objective measures in research, as subjective and observational measures dominated etiological studies in the past.

The incorporation of digital technology into cultural games not only increases the attractiveness toward digitally-reared youth but also allows the extension of longitudinal data, which will be sufficient to support evidence-based PE policy-making.

Scant tech-enabled interventions

Mainstream sports science already largely incorporates IoT and wearables; however, little has been done in the space of cultural and school-based traditional games.

We address the gaps above by integrating structured traditional game interventions with sensor-based movement tracking and statistical analysis in our article. In a technology-supported model, we endeavor to make traditional games pertinent in the present educational and healthcare landscape and break the heritage-digital health dichotomy by connecting heritage-rich games and modern digital health.

MATERIALS AND METHODS

Sample Selection

The students of JSS Public School, Mysore, were treated as subjects for this study. A total of 60 students (32 boys and 28 girls) aged between 11 and 15 years subjects were practically examined. Study variables compared on the experimental (30) group and the control (30) group.

Variables

- Agility
- Speed
- Explosive power
- Flexibility.

Tools Used

- Zig-Zag run test
- 50 m sprint
- Vertical jump
- Sit-and-reach test
- IMU sensors for movement tracking
- Force platform for jump measurement.

Research Procedure

Objectives of the study were briefly explained and with the consent of all subjects pre-tests administered to measure the agility, speed, explosive strength, and flexibility. The tests were conducted on the experimental group and the control group. The 6 week training to the experimental group. Three sessions of 45 min in a week are scheduled in this study. After 6 weeks, post-tests were administered. Pre- and post-tests of the players were carried out in accordance with the American College of Sports Medicine.

Statistical Techniques

To evaluate differences between pre- and post-test results, the following statistical tests were applied: (a) Descriptive Statistics, (b) Paired *t*-test, (c) One-way analysis of variance. All tests were carried out using Statistical Package for the Social Sciences v27.

ANALYSIS AND INTERPRETATION OF DATA

Key Observations

- Experimental group: Agility, speed, flexibility, and leg were significantly increased ($P = 0.05$).

DISCUSSION

The findings showed that traditional games have significantly higher effects ($P < 0.05$) on the physical indices of speed, agility, flexibility, and explosive strength as compared to conventional PE exercises. These results support previous studies of Munir[9] Annadurai and Kuppusamy[11] and Wicahyani *et al*.,[12] which found that cultural games are effective in promoting motor fitness.

The measuring of these technological improvements is in alignment with the WHO guidelines on inclusion of digital health in the education.[1,2] The method also complements India's Fit India Movement, which focus on culturally sensitive physical activity in schools.

CONCLUSION AND FUTURE DIRECTIONS

This study confirms the positive contribution of organized traditional play activities to the health, fitness, and sports performance of school-aged children. We found that by incorporating culturally applicable games, such as Kho-Kho, Kabaddi, Hopscotch, and Lagori into an intervention program, we could bring about significant enhancements in agility, speed, flexibility, and explosive power vis-à-vis the regular PE curriculum. Utilization of IMUs worn on the body and AI-based progression algorithms then allowed for accurate on-body performance measurement and fine-grained adaptive difficulty manipulation to ensure individualized progression and long-term engagement. These technology improvements also overcame some of the weaknesses of previous approaches, which were based on subjective judgments. The suggested hybrid model is inexpensive, scalable, and a school or community-based program applicable. In addition, this research is a bridge between heritage-based activities and state-of-the-art digital health interventions while encouraging sustainable fitness interventions. Future work should investigate long-term effects, transferability to multiple age groups, and the relationship with IoT-based health platforms. This two-pronged initiative provides a unique model for the

development of holistic education in schools with limited resources that does not ignore the local culture.

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Research Article

Effect of Yogasana and pranayama on physiological variables of high school girls

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ABSTRACT

The purpose of the study was to find out the effects of selected yogasanas, and pranayama on physiological variables of high school girls such as maximum expiratory pressure (MEP) and maximum inspiratory pressure (MIP). To achieve the purpose of this study 80 girls, students were selected from B. D. E Society Vijayapura Karnataka, India. At random and their age ranges from 14 to 16 years and all of them healthy and normal. They were divided in to two groups and designed as experimental and control group 40 girls students each. The experimental groups underwent a 12 weeks of yogasanas, and pranayama training was given. The control group was not allowed to participate in any of the training program except their routine physical education classes. The collected dada were analyzed using analysis of covariance. The results of the study showed that yogasanas and pranayama training can be an effective training program to increase the MEP and MIP of girls students.

Keywords: Maximum expiratory pressure and maximum inspiratory pressure, Pranayama, Yogasana

INTRODUCTION

Yoga is a physical, mental, and spiritual practice aimed at attaining permanent peace within. This practice for permanent inner peace originated in ancient India and it also belongs to the six schools of Hindu philosophy or six and quot; astika and quot; Yoga is also considered a form of exercise because of its physical forms and postures that have physical benefits to the body and it is also considered meditation because of the mental and emotional benefits. It gives as well as it is also considered spiritual because it involves getting in touch with your spirit or beyond physical nature. This is why yoga is known as a combination of physical, mental, and spiritual exercise and development or creating a union with your inner self which can benefit life.

The word yoga means “unity” or “oneness” and is derived from the Sanskrit word yuj, which means “to join.” This unity or joining is described in spiritual terms as the union of the individual consciousness with the universal consciousness. On a more practical level, yoga is a means of balancing and harmonizing the body, mind, and emotions. This is done through the practice of Asana, Pranayama, Mudra, Bandha, Shatkarma, and Meditation and must be achieved before a union can take place with the higher reality. The science of yoga begins to work on the outermost aspect of the personality, the physical body, which for most people is a practical and familiar starting point. When imbalance is experienced at this level, the organs, muscles, and nerves no longer function in harmony; rather they act in opposition to each other. For instance, the endocrine system might become irregular and the efficiency of the nervous system decrease to such an extent that a disease will manifest. Yoga aims at bringing the different bodily functions into perfect coordination so that they work for the good of the whole body.

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METHODOLOGY

Subjects for the present study were taken from forty girls students were selected from B. D. E Society Vijayapura Karnataka, India, at random and their age ranges from 14 to 16 years and all of them healthy and normal. The selected subjects were divided into two groups and designed as experimental group and control group forty girl’s students each. The experimental groups underwent a 12 week of yogasanas

and pranayama training. The control group was not allowed to participate in any of the training programs, except their routine physical education classes. A qualified physician examined the subjects medically and declared that they were fit for the study. The duration of the training period was 12 weeks with 6 days per week. On every day, the training was practiced approximately 45 min 50 under the instruction and supervision of the investigator. The analysis of covariance was applied to find out significant difference if any between experimental and control group. In all cases, 0.05 level of confidence was utilized to test the significance.

Result of the Study

Table 1 Shows that the pre-test means scores of maximum exploratory pressure level of control and experimental groups of high school girls students. It is observed that mean scores of pretest of control and experimental groups of high school girls students are 64.5000 and 69.9750 and their standard deviation are 17.23889 and 14.54170, respectively. The obtained "F" ratio value is (F = 0.129 1,78, α = 0.05).129 at 5% level of significance, which is less than the table value (F = 4.0), hence, the null hypothesis is accepted, it can be concluded that the maximum expiratory pressure (MEP) level between the experimental group and control group found almost similar among high school girls students.

Further, it is observed that mean scores of post-test of control and experimental groups of girls high school students are 68.0000 and 81.0000 and their standard deviation are 17.29829 and 14.54170, respectively. The obtained "F" ratio value is (F = 12.418 1, 78, α = 0.05) at 12.418 5% level of significance, which is much more than the table value (F = 4.0), hence, the null hypothesis is rejected and the alternative hypothesis is accepted. It can be concluded that there is significant difference found between the experimental group and control group with respect to MEP level of high school girl's students. This indicates that the MEP level is more among the control group when compared to the experimental group. Finally, it can be concluded that Yogasanas Pranayama and Meditation training has made a significant impact to control the MEP level of the high school girl's students.

The adjusted post-test mean scores on MEP of the control and the experimental groups are 70.723 and 79.386, respectively. The obtained "F" ratio value is (F = 16.047 1, 76, α = 0.05) 16.047 at 5% level of significance, which is much higher than the table value (F = 4.0), hence the null hypothesis is rejected and the alternative hypothesis is accepted. It can be concluded that there is a significant difference is found between the experimental group and the control group with respect to MEP level of high school girl's students. The results, by and large, were in conformity with the findings of Madanmohan *et al*. (1992).

Table 2 shows that the pre-test mean scores of maximum inspiratory pressure (MIP) level of control and experimental groups of high school girl's students. It is observed that mean scores of pre-test of control and experimental groups of high school girl's students are 65.0000 and 66.5000 and their standard deviation is 18.39732 and 18.74936, respectively. The obtained "F" ratio value is (F = 0.130 1, 78, α = 0.05). 130 at 5% level of significance, which is less than the table value (F = 4.0), hence, the null hypothesis is accepted, it can be concluded that the MIP level between the experimental group and control group found almost similar among the high school girl's students.

Further, it is observed that mean scores of post-test of control and experimental groups of girl high school students are 69.3750 and 83.0000 their standard deviation are 18.21621 and 17.57037, respectively. The obtained "F" ratio value is (F = 11.593 1, 78, α = 0.05) at 11.593 5% level of significance, which is much more than the table value (F = 4.0), hence, the null hypothesis is rejected and the alternative hypothesis is accepted. It can be concluded that there is significant difference found between the experimental group and control group with respect to MIP level of high school girl's students. This indicates that the MIP level is more among the control group when compared to the experimental group.

Finally, it can be concluded that yogasanas pranayama and meditation training has made a significant impact to control the MIP level of the high school girls students.

Table 1: The analysis of covariance for pretest and post-test on maximum exploratory pressure of control group and experimental group of high school girls

Type of test	Control group	Experimental group	Source of variance	Sum of the squares	df	Mean square	F ratio
Pre test mean	64.5000	69.9750	Between	599.512	1	599.512	0.129
SD	17.23889	14.54170	Within	19836.975	78	254.320	
Post test mean	68.0000	81.0000	Between	3380.000	1	3380.000	12.418
SD	17.29829	15.65657	Within	21230.000	78	272.179	
Adjusted post-test mean	70.723	79.386	Between	1455.710	1	1455.710	16.047
			Within	6894.479	76	6894.479	

*Significance α=0.05. Table value=4.0. SD: Standard deviation

Table 2: The analysis of covariance for pre-test and post-test on maximum inspiratory pressure of control group and experimental group of high school girls

Type of test	Control group	Experimental group	Source of variance	Sum of the squares	df	Mean square	F ratio
Pre test mean	65.0000	66.5000	Between	45.000	1	45.000	0.130
SD	18.39732	18.74936	Within	26910.000	78	345.000	
Post-test mean	69.3750	83.0000	Between	3712.813	1	3712.813	11.593
SD	18.21621	17.57037	Within	24981.375	78	320.274	
Adjusted post-test mean	70.113	82.474	Between	3050.482	1	3050.482	42.632
			Within	5438.053	76	71.553	

*Significance α=0.05. Table value=4.0. SD: Standard deviation

The adjusted post-test mean scores on MIP of the control and the experimental groups are 70.113 and 82.474, respectively. The obtained "F" ratio value is (F = 37.953 1, 76, α = 0.05) 37.953 at 5% level of significance, which is much higher than the table value (F = 4.0), hence the null hypothesis is rejected and the alternative hypothesis is accepted. It can be concluded that there is a significant difference is found between the experimental group and control group with respect to MIP level of a girls of high school students.

DISCUSSION ON FINDINGS

The result of the study revealed significant improvements in the variables such as MEP and MIP resting due to yogasana and pranayama training on the selected group. Participation in yogasana and pranayama training resulted in significant development in selected physiological variables such as maximum expiratory pressure and MIP resting on selected group when compared between pre and post-test.

CONCLUSION

The results of the study clearly showed that the effects of yogasana and pranayama training on physiological variables on high school level students were positively significant. The results proved that yogasana and pranayama are very helpful to improve physiological fitness of the high school girls.

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Research Article

Effects of kettlebell training with and without lower limb plyometric training on isometric hand strength and explosive power

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ABSTRACT

The purpose of the present study was to find the effect of kettlebell training with and without lower limb plyometric training on isometric hand strength and explosive power in terms of vertical distances. For this purpose, 45 male students from various colleges around Hyderabad, Telangana State, in the age group of 19–25 years were selected. They were divided into three equal groups (n = 15), in which group I underwent kettlebell training with lower limb plyometric training, group II underwent kettlebell training alone, and group III acted as a control group who did not participate in any special training. The training period for this study was 3 days in a week for 12 weeks. Before and after the training period, the subjects were tested for isometric hand strength and explosive power. Isometric hand strength was assessed using a handgrip dynamometer, and explosive power was assessed by administering the sergeant jump. The analysis of covariance was used to find the significant difference, if any, among the experimental groups and the control group on selected criterion variables separately. As there were four groups involved in this study, the Scheffé's test was used as a *post hoc* test. It was concluded from the result of the study that the combined kettlebell training with lower limb plyometric training and the kettlebell training alone groups have positively altered the criterion variables, such as isometric hand strength and explosive power. The result of the study also showed that there was a significant difference between the experimental groups, in favor of kettlebell training with the lower limb plyometric training group, on selected criterion variables.

Keywords: Combined kettlebell and lower limb plyometric training, Isometric hand strength and explosive power, Kettlebell training

INTRODUCTION

If exercise is paired with research or experience derived from scientific theories, it is more physically beneficial. Sports science is the study of the types of training that optimize the performance of athletes. Studying from diverse fields enhances the philosophy and practices of coaching. The old school concept of the science of training has athletes working for their coach or sports scientist, who has all the data possible.

The mechanisms behind physical exercise arise from physiological, anatomical, biochemical, and psychological adaptations. The basis of this is to increase a person's performance through the length, intensity, speed, load, frequency, and repetition of workouts. Competition will demonstrate the functional and psychological traits, so the schedule during dynamic training should consider the guaranteed components. Although limiting the time spent training during a session or period leading up to a competition is required, such factors can be physiological, psychological, or physical and can work in support of achieving the desired goal (Zatsiorsky, [1995]).

The primary goal of training is to encourage biological adaptation to enhance performance in a particular task. Certain training and loading must be done to hasten physiological progress and change. When a person exercises at a level that is close to normal, the body experiences a variety of training modifications that increase efficiency. Different training techniques are used at various levels to enhance various aspects of physical and motor fitness.

A kettlebell is a cannibal-shaped weight made out of iron or steel with a handle attached. It can be used for numerous

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workouts, including ballistic workouts that integrate strength, flexibility, and aerobic conditioning. They are the primary implements used in the weightlifting discipline of kettlebell lifting. It is widely accepted, however, that isolated muscle machines are dramatically less effective compared to kettlebell workouts, which are built on complex full-body movement for increasing muscular tone, body composition, and strength.

In the 2000s, Tsatsouline (2006) popularized hardstyle kettlebell training, which claims to improve health-related physical fitness measures. Its methods promote a unique combination of stress and relaxation. Trials involving younger participants have shown improvements in 1RM barbell deadlift (Maulit et al., 2017), standing long jump and grip strength (Elbadry *et al*., 2018), leg strength and trunk endurance (Beltz *et al*., 2013), upper limb endurance (Ambroży *et al*., 2017), dynamic balance and vertical leap (Jay *et al*., 2013), and VO2 (Falatic *et al*., 2015).

A profile of the kettlebell swing done by inexperienced older people shows that the peak net ground reaction force is higher during a swing with an 8 kg kettlebell than during a deadlift with a 32 kg kettlebell (Meigh *et al*., 2021). The swing's potential application in exercise prescription is shown by this study. Anecdotally, older people may and do engage in kettlebell training, despite the fact that there is less data about the activity's impact on this demographic.

Kettlebell training has been credited by several with helping them define and shape their muscles. For example, Reifkind (2018), a certified kettlebell instructor, attributes her initial and subsequent muscular definition to kettlebell swings. A limited number of kettlebell usage variations have been shown to concurrently activate many muscles while placing unique demands on each muscle (Maulit *et al*., 2017).

It is crucial to concentrate on workouts that target the same muscles as those utilized when combining kettlebells and plyometrics. Goblet squats and kettlebell swings, for instance, may work the hamstrings, quadriceps, and glutes. Box leaps and lateral hops are examples of plyometric workouts that can assist in increasing explosive power and agility. It is crucial to keep in mind that good form and technique are required for both plyometric and kettlebell training. In addition, the training intensity should be modified based on the fitness level of the individual.

MATERIALS AND METHODS

This study under investigation involves the experimentation of the effect of kettlebell training with and without lower extremity plyometric training on isometric hand strength and explosive power. Only college male students from various degree colleges around Hyderabad, Telangana State, in the age group of 19–25 years were selected. They were divided into three equal groups (n = 15), in which group I underwent kettlebell training with lower limb plyometric training, group II underwent kettlebell training alone, and group III acted as a control group who did not participate in any special training. The training program was carried out for 3 days (Monday, Wednesday, and Friday) per week during morning sessions only (6–8 am) for 12 weeks. Isometric hand strength was assessed using a dynamometer, and explosive power was assessed by administering the sergeant jump.

ANALYSIS OF DATA

The data collected before and after the experimental periods on isometric hand strength and explosive power of kettlebell training with and without lower extremity plyometric training groups and control groups were analyzed and presented in Table 1.

Table 1 displays the "F" ratio values of pre-test means of isometric hand strength for kettlebell training with lower limb plyometric training, and kettlebell training and control groups were 0.179, which was less significant. The "F" ratio of post-adjusted post-test means was 8.45 and 35.32, which were superior to the requisite table value of 3.22 and 3.21 for significance with df 2 and 42 and 2 and 41 at the 0.05 level of confidence. The result of this study showed that there was a significant dissimilarity between the kettlebell training with lower limb plyometric training group and kettlebell training group and the control group on muscular endurance.

Table 1 shows the "F" ratio values of pre-test mean of explosive power for kettlebell training with lower limb plyometric training, and the kettlebell training and control groups were 0.028, which was not significant at the 0.05 level of confidence. The "F" ratio of post- and adjusted post-test means was 15.86 and 79.11, respectively, and was superior to the requisite table value of 3.22 and 3.21 for significance with df 2 and 42 and 2 and 41 at the 0.05 level of confidence. The result of this study showed that there was a significant dissimilarity among the kettlebell training with lower limb plyometric training group and kettlebell training group and the control group on explosive power.

Further to determine which of the paired means has a significant difference, Scheffĕ's test was applied as a *post hoc* test. The result of the follow-up test is presented in Table 2.

RESULTS

After applying the analysis of covariance, the result of this study showed that there was a significant difference among

Table 1: Analysis of covariance and "F" ratio for isometric hand strength and explosive power for kettlebell training with and without lower extremity plyometric training and a control group

Variable name	Group name	Kettlebell training with lower limb plyometric training group	Kettlebell training group	Control group	"F" ratio
Isometric hand strength (in kg)	Pre-test Mean±SD	35.20±2.18	35.21±1.08	35.53±1.84	0.179
	Post-test Mean±SD	37.80±2.21	37.53±2.00	34.93±2.12	8.45*
	Adj. Post-test Mean	37.912	37.645	34.709	35.32*
Explosive power (No/Min)	Pre-test Mean±SD	0.209±0.019	0.208±0.018	0.208±0.015	0.028
	Post-test Mean±SD	0.237±0.021	0.260±0.016	0.204±0.011	15.86*
	Adj. Post-test Mean	0.237	0.226	0.204	79.11*

*Significant at the 0.05 level of confidence (the table value required for significance at the 0.05 level with df 2 and 42 and 2 and 41 are 3.22 and 3.21, correspondingly)

Table 2: Scheffē's test for the difference between the adjusted post-test means of isometric hand strength and explosive power among experimental groups and control group

Combined kettlebell and plyometric training group	Adjusted post-test mean of isometric hand strength			
	Kettlebell training group	Control group	Mean difference	Confidence interval at 0.05 level
37.912	37.645	…	0.267	1.644
37.912	…	34.709	3.203*	1.644
…	37.945	34.709	2.936*	1.644
Adjusted post-test mean of explosive power				
0.237	0.226	…	0.010*	0.006
0.237	…	0.204	0.032*	0.006
…	0.226	0.204	0.022*	0.006

the kettlebell training with lower limb plyometric training group and the kettlebell training group and the control group on the changes in isometric hand strength and explosive power after 12 weeks of training. The criterion variables, such as isometric hand strength and explosive power, were improved for the kettlebell training with the lower limb plyometric training group and the kettlebell training group. Basically, the kettlebell training with lower limb plyometric training group and the kettlebell training group have tremendously improved the fitness variables.

CONCLUSIONS

Kettlebell training with lower limb plyometric training group and kettlebell training group showed significant increases in isometric hand strength as compared to the control group. The results of the study show a significant improvement in hand grip strength after using a kettlebell alone plus lower limb plyometric exercise. Meigh *et al*. (April 2022), Beltz *et al*. (2013), and Kavikumar and Arumugam (2020) found that hand grip strength significantly improved with the kettlebell training alone program. Moreover, between the training groups, a significant difference in hand grip strength was found in favor of kettlebell training with the lower limb plyometric training group.

According to the results of the study, vertical leap was considerably increased using a kettlebell in conjunction with plyometric training and a kettlebell training program. According to Kim *et al*. (2024), a combination of plyometric and kettlebell training led to a notable improvement in vertical leap. Maulit *et al*. (2017) and Meigh *et al*. (2022) found that the vertical leap was greatly enhanced by the kettlebell program. In addition, there was a notable difference between the training groups, particularly in favor of the group that mixed plyometric and kettlebell exercise.

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Research Article

Effect of game-specific fitness training with and without mindfulness meditation on self-confidence of cricket players

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ABSTRACT

Self-confidence is a crucial psychological trait that significantly influences an athlete's performance, particularly in high-pressure sports like cricket. It impacts decision-making, coping mechanisms, and the ability to perform under stress. Cricket, being a multifaceted sport, demands both physical and mental preparedness. While game-specific fitness training (GSFT) enhances the physical capabilities of players by targeting the specific movements and demands of the sport, mindfulness meditation is gaining recognition for its ability to improve mental focus, reduce anxiety, and enhance self-confidence in athletes. This study investigates the combined effect of GSFT with and without mindfulness meditation on the self-confidence of cricket players. A total of 45 male cricket players aged 18–23 years from rural areas were randomly assigned to three groups: (1) GSFT with mindfulness meditation, (2) GSFT without mindfulness meditation, and (3) a control group. Each experimental group underwent 12 weeks of training, with 6 sessions/week. Self-confidence was measured before and after the intervention using standardized assessment tools. The results indicated that both GSFT with mindfulness meditation and GSFT alone led to significant improvements in self-confidence. However, the GSFT with mindfulness meditation group demonstrated a greater increase in self-confidence (17.17%) compared to the GSFT group (8.60%). Statistical analyses, including paired t-tests and ANCOVA, confirmed that the GSFT with mindfulness meditation group showed the most significant improvement. These findings suggest that incorporating mindfulness meditation into GSFT can further enhance self-confidence in cricket players, offering practical insights for coaches and sports psychologists seeking to improve athlete performance.

Keywords: Mindfulness meditation on self-confidence of cricket players

INTRODUCTION

Self-confidence plays a critical role in an athlete's performance, especially in high-pressure situations like those often encountered in cricket. It affects decision-making, coping mechanisms, and the ability to perform under stress (Jones and Wallis, 2021). Cricket, being a multifaceted sport involving batting, bowling, and fielding, demands not only physical fitness but also a strong mental game. A confident player is likely to perform with greater consistency and resilience, making self-confidence an essential psychological trait for success in cricket (Gould, 2021).

Recent advancements in training regimens have emphasized the importance of mental conditioning alongside physical fitness training. Game-specific fitness training (GSFT), which targets the physical demands and movement patterns of a sport, has been proven to enhance overall performance in cricket players (Brown and Johnson, 2022). Unlike general fitness, GSFT involves exercises that simulate the movements required on the field, thereby improving sport-specific agility, endurance, and strength (Thompson *et al*., 2018). Through GSFT, cricket players are better prepared to meet the physical challenges of the game, leading to increased self-assurance in their athletic capabilities.

In addition to physical fitness, mindfulness meditation has gained popularity as a tool for improving mental skills in athletes. Mindfulness is the practice of focusing one's attention on the present moment, cultivating awareness, and reducing stress (Kuyken *et al*., 2020). Numerous studies have suggested that mindfulness meditation can enhance self-confidence in athletes by reducing anxiety, improving focus, and helping

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athletes remain calm under pressure (Raab *et al*., 2022). This mental training technique is especially beneficial for cricket players who must perform tasks requiring both physical and psychological precision, such as managing pressure during batting or bowling spells.

Despite the growing body of research on both GSFT and mindfulness, there is limited understanding of how combining these two approaches might affect self-confidence specifically in cricket players. The potential synergistic effects of GSFT and mindfulness meditation on self-confidence could provide valuable insights into how mental and physical training complements each other to enhance performance. Therefore, this study aims to examine the effect of GSFT, with and without mindfulness meditation, on the self-confidence of cricket players. The findings from this study could offer new strategies for improving the mental and physical conditioning of athletes, with potential applications across various sports, especially cricket.

METHODOLOGY

Selection of Subjects

To achieve the purpose of the study, the investigator chosen 45 rural area cricket players as participants in the age group of 18–23 years. The selected subjects ($n = 45$) were classified into three groups of twenty each ($n = 45$) at random. Group-I underwent game-specific fitness training with mindfulness meditation (GSFTMM), Group-II underwent game-specific fitness training without mindfulness meditation, and Group-III acted as control. The selected subjects were medically examine by a qualified physician to check whether they are medically and physically fit enough to undergo the training program. All participants were informed about the nature of study and their consent was obtained for co-operation till the end of the experimental period. The experimental groups underwent their respective training program for 6 days in a week for 12 weeks. The subjects were free to withdraw their consent in case that they felt any discomfort during the period of their participation and there were no dropouts in this study.

SELECTION OF VARIABLES

Independent Variables

Cricket is a game with number of skills such as batting, bowling, fielding, and running between wickets. The execution of skills depends on the physical fitness levels of each cricket player. Cricket is an endurance game and requires potential stamina to excel the performance. Although every player of the team is required to bat and field during the match, generally, each player possesses specific skills that define their role and contribute to overall performance of the game.

Exercise is an incredibly important part of a healthy person's life. Exercising regularly helps to hone one's athletic skills by strengthening the muscles across the bodies, and also by enhancing the functioning of all internal organs. Moreover different activities make different demands on the organism with respect to circulatory, respiratory, metabolic, and neurological process which are specific to the activities. There are plenty of different ways to exercise and all of them can be turned into a fun and entertaining outing.

To assess the training impact on performance determinants of rural area cricket players, the investigator selected game-specific fitness training and mindfulness meditation as the independent variable. Information related to the impact of game-specific fitness training and mindfulness meditation among rural area cricketers is scanty. Hence, the present study is planned.

Dependent Variables

1. Self-confidence.

ANALYSIS OF THE DATA AND RESULTS OF THE STUDY

The pre-test and post-test values of both training groups (GSFTMM and GSFT) vary noticeably as the "t" values of GSFTMM = 9.03) and game-specific fitness training without mindfulness meditation (GSFT = 6.28) groups were superior to table value (df14 = 2.15). Subsequent to 12 weeks of (GSFTMM = 17.17%) and game-specific fitness training without mindfulness meditation (GSFT = 8.60%), the cricket player's self-confidence was enhanced noticeably [Table 1].

Further, all 3 groups (GSFTMM, GSFT, and CG) cricket player's self-confidence was explored using ANCOVA statistics and exhibited in Table 2.

The ANCOVA result proved that the adjusted final means (GSFTMM = 20.80, GSFT = 22.94 and CG = 25.01) on self-confidence of all three chosen groups significantly differs, as the derived "F" value (25.18) is better than the required value (df 2 and 41 =3.23). As the adjusted final means is significant, the follow-up test was applied as put on view in Table 3.

It proved that due to (GSFTMM = 4.20) and game-specific fitness training without mindfulness meditation (GSFT = 2.06), the self-confidence was greatly enhanced. Although, GSFTMM was much better than game-specific fitness training without mindfulness meditation (GSFT) since the mean differences (2.14) is higher than CI value (1.49). Chosen three group's self-confidence scores are illustrated in Figure 1.

Table 1: Paired "t" test and % of alteration on self-confidence of game-specific fitness training with and without mindfulness meditation and control groups cricket players

Chosen group	Time of test	No.	Test mean	Standard	DbM	"t" - ratio	% of progress
Game-specific fitness training and mindfulness meditation	Pre-test	15	25.05	1.85	4.30	9.03*	17.17
	Post-test		20.75	2.81			
Game-specific fitness training	Pre-test	15	25.00	2.03	2.15	6.28*	8.60
	Post-test		22.85	2.37			
Control (CG)	Pre-test	15	25.30	1.81	0.15	0.34	0.59
	Post-test		25.15	1.87			

Table value for df 14=2.15 (*Significant)

Table 2: ANCOVA output on self-confidence of game-specific fitness training with and without mindfulness meditation and control groups cricket players

Mean	Game-specific fitness training and mindfulness meditation	Game-specific fitness training	Control (CG)	SoV	S.S.	df	M.S.	"F" ratio
Adjusted posttest	20.80	22.94	25.01	B	176.18	2	88.09	25.18*
				W	195.95	41	3.50	

(Table value for df 2 and 41=3.23), *Significant (0.05 level)

Table 3: Scheffe's test outcome on self-confidence of game-specific fitness training with and without mindfulness meditation and control groups cricket players

Dependent Variable	Game-specific fitness training	Skill based training	Control (CG)	Mean difference	Confidence interval
Self-confidence	20.80	22.94		2.14*	1.49
	20.80		25.01	4.20*	1.49
		22.94	25.01	2.06*	1.49

*Significant (0.05)

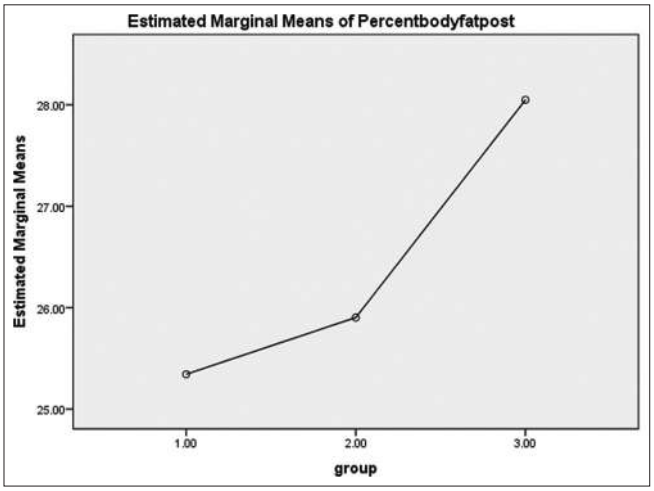

Figure 1: Chart showing self-confidence of game-specific fitness training with and without mindfulness meditation and control groups cricket players

RESULTS OF THE STUDY

Subsequent to 12 weeks of (GSFTMM = 17.17%) and game-specific fitness training without mindfulness meditation (GSFT = 8.60%), the cricket player's self-confidence was enhanced noticeably. Although, GSFTMM was much better than game-specific fitness training without mindfulness meditation (GSFT).

CONCLUSION

The findings of the present and previous studies have demonstrated that GSFTMM and game-specific fitness training without mindfulness meditation (GSFT) working out programs resulted in larger development in performance determinants of men rural area cricket players. The greater part of evidence has confirmed that GSFTMM and game-specific fitness training without mindfulness meditation (GSFT) working out can be worn to simulate the overall requirements of contest. From a practical perspective, GSFTMM and GSFT with mindfulness meditation working out should be supplemented with additional traditional workouts to simulate the high-intensity, repeated-sprint demands of contest. Alternatively, coaches can amend the content and nature of GSFTMM to boost the fitness requirements of the working out stimulus.

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Research Article

Effect of game-specific fitness training with and without mindfulness meditation on the agility of cricket players

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ABSTRACT

This study investigates the effect of game-specific fitness training (GSFT) with and without mindfulness meditation (MM) on the agility of cricket players. Agility, a crucial physical attribute in cricket, significantly influences performance in activities, such as batting, bowling, and fielding. To assess the impact of these training regimens, 45 rural area cricket players, aged 18–23, were randomly assigned to three groups: GSFT with MM (GSFTMM), GSFT without MM (GSFT), and a control group (CG). Over a 12-week period, the two experimental groups underwent their respective training 6 days a week, while the CG maintained their regular routine. The primary dependent variable was agility, assessed using the shuttle run test. Pre-test and post-test results indicated significant improvements in agility for both GSFTMM (7.92%) and GSFT (4.58%) groups, with the GSFTMM group showing superior gains. Statistical analysis through analysis of covariance confirmed significant differences between the groups ($F = 20.72$, $P < 0.05$), and follow-up Scheffé's test further revealed that GSFTMM outperformed both GSFT and the CG. These findings suggest that combining MM with GSFT can lead to greater improvements in agility compared to traditional fitness training alone. This study highlights the potential benefits of integrating mental conditioning with physical training to enhance performance in cricket players.

Keywords: Mindfulness meditation on the agility of cricket players

INTRODUCTION

In the modern era of cricket, the physical demands placed on players have evolved significantly, necessitating not only technical expertise but also exceptional physical conditioning. Agility, the ability to change direction quickly and effectively, is one of the most important physical attributes in cricket (Markovic, 2020). Players must demonstrate high levels of agility to perform well in various aspects of the game, including batting, bowling, and fielding (Smith and Jones, 2019). Thus, improving agility through specific training regimens has become a key focus for coaches and athletes alike (Chung *et al.*, 2021).

Game-specific fitness training (GSFT) has been a prominent method for enhancing physical performance in sport (Brown and Johnson, 2022). Unlike general fitness, GSFT tailors exercises to replicate the movement patterns and demands of a particular sport (Thompson *et al*., 2018). In cricket, GSFT often involves exercises that mimic on-field movements, such as sprinting, side-stepping, and rapid deceleration (Renshaw *et al*., 2020). These training programs aim to improve agility, strength, and endurance in players, which are crucial for successful performance (Williams, 2019).

Mindfulness meditation (MM), which focuses on cultivating awareness and attention, has gained significant attention in recent years as a potential tool for improving athletic performance (Gould, 2021). Research has shown that mindfulness can enhance concentration, reduce anxiety, and foster a calm, focused mental state, which is essential for performance under pressure (Kuyken *et al*., 2020). When integrated with physical training, mindfulness may also improve motor skills and decision-making, thereby contributing to better athletic outcomes (Raab *et al*., 2022). However, the specific impact of combining MM with GSFT on agility performance in cricket players remains under-explored.

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This research aims to explore the effects of GSFT, with and without MM, on the agility of cricket players. By analyzing the outcomes of these two different training approaches, the study seeks to contribute valuable insights into how physical and mental conditioning can synergistically enhance performance in cricket. The potential benefits of integrating mindfulness into physical training regimens could offer new strategies for improving the agility and overall performance of cricket players.

METHODOLOGY

Selection of Subjects

To achieve the purpose of the study, the investigator chosen 45 rural area cricket players as participants in the age group of 18–23 years. The selected subjects (n = 45) were classified into three groups of twenty each (n = 45) at random. Group-I underwent game-specific fitness training with MM, group-II underwent game-specific fitness training without MM, and group-III acted as a control. The selected subjects were medically examine by a qualified physician to check whether they are medically and physically fit enough to undergo the training program. All participants were informed about the nature of the study and their consent was obtained for co-operation till the end of the experimental period. The experimental groups underwent their respective training program for 6 days in a week for 12 weeks. The subjects were free to withdraw their consent in case they felt any discomfort during the period of their participation and there were no dropouts in this study.

SELECTION OF VARIABLES

Independent Variables

Cricket is a game with a number of skills, such as batting, bowling, fielding, and running between wickets. The execution of skills depends upon the physical fitness levels of each Cricket player. Cricket is an endurance game and requires potential stamina to excel the performance. Although every player of the team is required to bat and field during the match, generally, each player possesses specific skills that define their role and contribute to the overall performance of the game.

Exercise is an incredibly important part of a healthy person's life. Exercising regularly helps to hone one's athletic skills by strengthening the muscles across the bodies, and also by enhancing the functioning of all internal organs. Moreover, different activities make different demands upon the organism with respect to circulatory, respiratory, metabolic, and neurological process, which are specific to the activities. There are plenty of different ways to exercise and all of them can be turned into a fun and entertaining outing.

To assess the training impact on performance determinants of rural area cricket players, the investigator selected game-specific fitness training and MM as the independent variable. Information related to the impact of game-specific fitness training and MM among rural area cricketers is scanty. Hence, the present study is planned.

Dependent Variables

1. Agility.

ANALYSIS OF THE DATA AND RESULTS OF THE STUDY

Analysis of Agility Performance

The player's (rural area cricket) agility performance was explored (Paired "t" Test) statistically and presented in Table 1.

The pre-test and post-test values of both training groups (GSFTMM and GSFT) vary noticeably as the "t" values of game-specific fitness training with MM (GSFTMM = 4.241) and game-specific fitness training without MM (GSFT = 4.595) groups were superior to the table value (df14 = 2.15).

Subsequent to 12 weeks of game-specific fitness training with MM (GSFTMM 7.92%) and game-specific fitness training without MM (GSFT = 4.58%), the rural area cricket player's agility (shuttle run) performance was enhanced noticeably. Further, all 3 groups (GSFTMM, GSFT and control group [CG]) rural area cricket player's agility performance was explored by using analysis of covariance (ANCOVA) statistics and exhibited in Table 2.

Table 1: Paired "t" test and % of alteration on agility performance of game-specific fitness training with and without mindfulness meditation and control groups

Chosen group	Time of test	No.	Test mean	STD	DbM	"t" - ratio	Percentage of progress
Game-specific fitness training and mindfulness meditation (GSFT and MM)	Pretest	15	10.840	0.8426	0.859	4.241*	7.92%
	Post-test		9.981	0.4318			
GSFT	Pre-test	15	10.935	0.5516	0.501	4.595*	4.58%
	Post-test		10.434	0.5786			
Control group	Pre-test	15	10.956	0.5465	0.109	0.750	0.99%
	Post-test		11.065	0.4910			

Table value for df 14=2.15 (*significant)

Table 2: Analysis of covariance output on agility performance of game-specific fitness training with and without mindfulness meditation and control groups cricket players

Mean	Game-specific fitness training and mindfulness meditation (GSFT and MM)	GSFT	Control group	SoV	S.S.	df	M.S.	"F" ratio
Adjusted Post-test	10.009	10.420	11.051	B	8.224	2	4.112	20.72*
				W	8.136	41	0.198	

(Table value for df 2 and 41=3.23) *Significant (0.05 level)

Table 3: Scheffe's test outcome on agility performance of game-specific fitness training with and without mindfulness meditation and control groups

Dependent variable	Game-specific fitness training and mindfulness meditation (GSFT and MM)	GSFT	Control group	Mean differences	Confidence interval
Agility	10.009	10.420		0.411*	0.41
	10.009		11.051	1.042*	0.41
		10.420	11.051	0.631*	0.41

*Significant (0.05)

The ANCOVA result proved that the adjusted final means (GSFTMM = 10.009, GSFT = 10.420 and CG = 11.051) on agility performance of all 3 chosen groups significantly differ, as the derived "F" value (20.72) is better than the required value (df 2 and 41 = 3.23). As the adjusted final means are significant, the follow-up test was applied as put on view in Table 3.

It proved that due to game-specific fitness training with MM (GSFTMM 1.042) and game-specific fitness training without MM (GSFT = 0.631), the agility performance was greatly enhanced. Although game-specific fitness training with MM (GSFTMM) was much better than game-specific fitness training without MM (GSFT) (0.41) since the mean differences (0.41) are higher than CI value (0.41). The chosen three group's agility performance scores are illustrated in Figure 1.

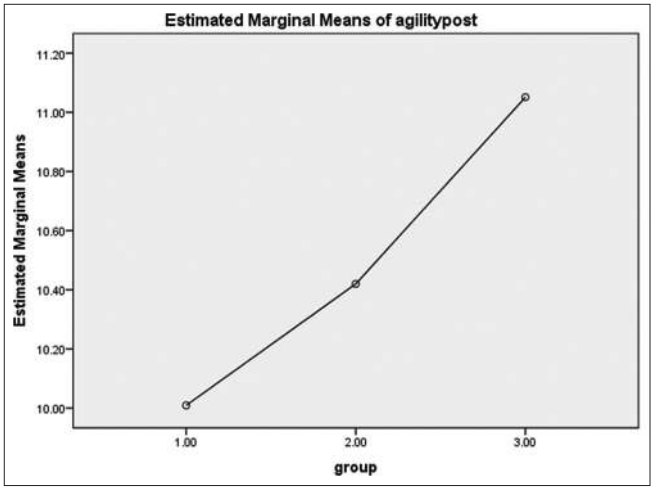

Figure 1: Chart showing agility of game-specific fitness training with and without mindfulness meditation and control groups cricket players

RESULTS OF THE STUDY

Subsequent to 12 weeks of game-specific fitness training with MM (GSFTMM 7.92%) and game-specific fitness training without MM (GSFT = 4.58%), the rural area cricket player's agility (shuttle run) performance was enhanced noticeably. Although game-specific fitness training with MM (GSFTMM) was much better than game-specific fitness training without MM (GSFT).

CONCLUSION

The findings of the present and previous studies have demonstrated that game-specific fitness training with MM (GSFTMM) and game-specific fitness training without MM (GSFT) working out programs resulted in larger development in performance determinants of men in rural area cricket players. The greater part of evidence has confirmed that game-specific fitness training with MM (GSFTMM) and game-specific fitness training without MM (GSFT) working out can be worn to simulate the overall requirements of contest. From a practical perspective, game-specific fitness training with MM (GSFTMM) and game-specific fitness training with MM (GSFT) working out should be supplemented with additional traditional workouts to simulate the high-intensity, repeated-sprint demands of a contest. Alternatively, coaches can amend the content and nature of game-specific fitness training with MM (GSFTMM) to boost the fitness requirements of the working out stimulus.

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Research Article

Systematizing the theoretical basis of the economic impact of sports event

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ABSTRACT

In the context of globalization and deep international integration, sports events not only carry cultural and social significance but also play the role of a catalyst for economic development in many countries and localities. This paper focuses on systematizing the theoretical bases related to the economic impact of sports events by synthesizing domestic and international literature. Based on these theories, the paper analyzes aspects such as employment, consumption, infrastructure, GDP, and factors that influence economic outcomes. At the same time, the paper introduces several common measurement models, including Input–Output analysis, Cost–Benefit Analysis, Social Accounting Matrix, Legacy Evaluation Model, direct economic impact, and multiplier effects, to comprehensively assess the economic impact of sports events. The results of this study contribute to building the theoretical foundation and provide reference materials for scientific research as well as practical application in evaluating, policy planning, and effectively exploiting the economic value of sports events in Vietnam.

Keywords: Economic impact of sports events, Economy, Impact measurement models, Sports events

INTRODUCTION

In the context of globalization and deep international integration, sports events not only bear cultural and social significance but also act as a catalyst to spur economic development in many countries. Organizing sports events at levels from local to national and international—such as the National Sports Games, SEA Games, or the Olympics—not only provides a stage for athletes but also contributes to increased consumption, tourist attraction, national image promotion, and job creation.

In many developed countries, sports events are considered an indispensable part of a socioeconomic development strategy. International studies have also affirmed that the economic impacts of sports events are multi-dimensional, including direct impacts from spending by visitors and organizers; indirect impacts through ancillary service sectors; and induced impacts due to increased income and consumption in the local community.

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However, in Vietnam, the evaluation of the economic impact of sports events remains descriptive, lacking a clear theoretical framework and appropriate analytical tools. In this context, systematizing the theoretical bases of the economic impact of sports events is an urgent requirement to create a foundation for applied research and support the process of sports policy planning linked to economic development.

This paper aims to synthesize and analyze concepts, influence mechanisms, and popular analytical models related to the economic impact of sports events, thereby providing a scientific theoretical basis for in-depth research and proposing practical policies appropriate to Vietnam's conditions.

LITERATURE REVIEW

In recent years, sports events have been increasingly emphasized by many countries as a strategic tool to promote socioeconomic development. From a theoretical perspective, researchers approach sports events as a form of integrated socioeconomic activity, encompassing elements such as culture, education, tourism, media, and commerce (Preuss, 2007).

Besides traditional economic theories, the study of the economic impact of sports events needs to be placed in the context of urban development, destination branding, and economic revitalization. Gratton *et al*. (2005) argued that sports events are a key factor in strategies for economic and social regeneration in many industrial cities in Europe. The impact is not only confined to short-term financial benefits but also relates to enhancing status, competitive capacity, and social cohesion.

In developed countries such as Germany, the United States, and the United Kingdom, sports events are seen as a means to restructure and stimulate local economies. Gratton and Preuss (2008) noted that if properly planned, large sports events such as the Olympics can leave a long-lasting "economic legacy" through infrastructure, human resources, organizational skills, and brand proliferation. Similarly, Van Sluijs *et al*. (2011) pointed out that policies combining sports and education, especially at the community level, serve as a lever for sustainable socioeconomic development.

Moreover, the assessment of the economic impact of sports events needs to be approached through multi-dimensional theoretical models. In this regard, substitution effect theory, regional development theory, and the Input–Output model are effective tools for measuring the degree of economic spillover, public investment efficiency, and actual value added (Crompton, 1995; Baade and Matheson, 2004). These tools have been recommended by the OECD (2021) as standard evaluation methods in reports on the impact of sports events.

Building on this theoretical foundation, the paper will analyze specific aspects of the economic impact of sports events in depth, drawing on international research and appropriately applying it to the context of Vietnam.

RESEARCH METHODOLOGY

This paper uses a method of document analysis and synthesis from various data sources to collect, classify, and analyze academic literature as well as research reports related to the economic impact of sports events. The research process was carried out in the following steps:

- Document search: Documents were retrieved through electronic databases such as Google Scholar, JSTOR, and Scopus, as well as digital libraries of international organizations such as the IOC, FIFA, OECD, and the World Bank. Search keywords included: "economic impact of sport events," "mega sport event legacy," "sports and economic development," "Input–Output model in sports," etc.
- Selection and filtering: The literature was selected based on direct relevance to the research topic, reliability (peer-reviewed scientific publications, monographs, official reports), and publication timeframe from 1995 to the present to ensure up-to-date information.
- Content analysis: The collected documents were categorized into major groups, including impact evaluation models, foundational theories (e.g., substitution effect, event legacy), and specific impact areas (employment, infrastructure, tourism, GDP growth).
- Synthesis and systematization: Key content was extracted, cross-checked, and compared to form a comprehensive theoretical framework that serves the objectives of the study.

This approach helps ensure objectivity, reliability, and comprehensiveness in building the theoretical foundation for analyzing the economic impact of sports events.

RESULTS

Overview of Sports Events

Definition of sports events

Sports events are understood as organized sports competitions or performances that are concentrated in nature, taking place within a defined time frame and space, with the participation of the public, athletes, organizations, and businesses.

According to Preuss (2007), sports events can be classified by scale (local, national, international), by organizational form (professional, grassroots), and by purpose (commercial, cultural, social, educational). These events not only have value in terms of sports but also produce positive effects in other fields, especially the economy, by stimulating consumption, increasing tourism, upgrading infrastructure, and enhancing the local image.

Sports events are a type of event that is planned and systematically organized, capable of attracting a large audience and generating economic, social, and cultural impacts for the community where the event takes place (Getz, 2005).

Sports events are activities organized with the aim of sports competition or performance, usually involving spectators, and requiring strict management in planning, finance, marketing, and operations (Shone and Parry, 2010).

Sports events are events organized with the main purpose of sporting competition, which may be international or local in scale, and require strategic management to achieve success and create a lasting legacy (Masterman, 2009).

Key economic characteristics of sports events

- Direct and indirect economic impacts: Sports events can generate significant revenue through ticket sales, sponsorships, advertising, accommodation, food services, and tourism – thereby contributing to the local economy (Getz, 2005).

- Scale and consumption stimulus: Large-scale sports events that attract thousands of attendees lead to increased spending on transportation, lodging, entertainment, etc., thus boosting cash flow in the local economy (Preuss, 2007).
- Ability to attract investment and sponsorship: Sports events provide a platform to attract investment from businesses through sponsorship activities and brand promotion, thereby creating financial resources for sports development and infrastructure (Masterman, 2009).
- Job creation and business opportunities: Organizing sports events helps create temporary or long-term jobs in related sectors such as tourism, hospitality, media, logistics, and event services (Gratton and Preuss, 2008).
- Cyclical nature and impact on local economic planning: Sports events often occur seasonally or in cycles, helping localities plan short-term and long-term economic development around sports and festival activities (Chalip, 2004).

Aspects of the Economic Impact of Sports Events

The economic impact of sports events is one of the most widely studied topics. The main aspects are as follows:

Employment

Large sports events like the World Cup can create many direct and indirect jobs. However, some studies show that the actual impact on the labor market may not be as significant as expected. For example, Baade and Matheson (2004) analyzed the economic impact of the 1994 World Cup in the United States and found that host cities did not achieve the predicted income growth.

Spending and consumption

Major sports events stimulate spending in sectors such as tourism, merchandise (souvenirs), food, and entertainment. Lee and Taylor (2005) studied sports tourism and found that international sports events can significantly boost visitor spending, contributing to revenue growth in the host region.

Tourism development

International sports events create opportunities to attract foreign visitors, which contributes positively to the host country's service trade balance. The OECD (2021) emphasized that global events can spur tourism growth and expand the host country's tourism economy.

Infrastructure investment

Hosting large sports events often spurs investment in infrastructure such as transportation systems, sports venues, and urban services. Preuss (2007) noted that the legacies from sports events include both tangible and intangible structures created before and after the event.

GDP growth

If efficiently organized, major sports events can contribute to national GDP growth in the short term. The OECD (2021) suggested that global events, including sports events, can drive economic growth and innovation, but they need careful planning to yield long-term benefits.

Factors Influencing the Extent of the Economic Impact of Sports Events

The economic impact of a sports event is not uniform; it depends on many important factors. The main factors often mentioned in academic studies include:

- Event scale and reach: Large-scale sports events such as the Olympics, the World Cup, or continental championships have a stronger impact than local events due to the greater number of participants, tourists, and broad media coverage (Preuss, 2007).
- Spending capacity of attendees: International visitors or high-income spectators tend to spend more on lodging, dining, souvenirs, and tickets, thereby increasing the economic value the event generates (Lee and Taylor, 2005).
- Timing and periodicity: Events held during peak tourism seasons or that last multiple days tend to create stronger economic impacts. In addition, events that occur regularly help build investor confidence and attract visitors to return (Chalip, 2004).
- Strategy for leveraging event legacy: Having a clear strategy to utilize infrastructure, brand image, and organizational experience after the event is crucial for converting short-term benefits into long-term economic value (Gratton and Preuss, 2008).
- Coordination among stakeholders: The economic impact depends on effective coordination between local authorities, organizers, businesses, and the community – from planning and service provision to event promotion (OECD, 2021).

Some Models for Measuring the Economic Impact of Sports Events

Measuring the economic impact of sports events often relies on empirical economic models to estimate in detail the effects on total spending, employment, income, and GDP. Below are some commonly used models:

Input–output (I-O) model

The input–output (I-O) model is an economic analysis tool developed by economist Wassily Leontief, used to describe the interdependent relationships between sectors in an economy. In the context of sports events, this model allows estimation of an event's spillover economic impact through three levels as follows:

- Direct impact: The direct spending by tourists, organizers, athletes, etc. (e.g., on hotels, food, tickets, transportation).

- Indirect impact: The spending by businesses that supply goods and services in support of the event (e.g., printing services, food suppliers, logistics).
- Induced impact: The spending by residents who benefit from the additional income generated by the event (e.g., hotel staff using their wages for additional purchases).

Advantages of the I-O model:
- Simple, easy to apply, and highly intuitive.
- Allows calculation of the total economic value generated in the short term.
- Suitable for analyses at regional and national levels, provided the corresponding I-O tables are available.

Main limitations:
- Does not reflect the substitution effect: Local residents may simply redirect their spending (e.g., spending at the event instead of elsewhere) rather than increase total spending.
- Does not account for leakage: A portion of the profits may flow out of the host area (e.g., to international companies or external investors).
- Assumes fixed input–output coefficients, which are inflexible to market or technological changes.

The I-O model uses a multiplier to calculate the total economic impact from the initial spending, according to the formula:

$$\text{Total Impact} = \text{Direct spending} \times \text{multiplier}$$

In which:
- Direct spending: the total amount of money spent by visitors, organizers, participating businesses, etc., due to the event.
- Multiplier: a factor that reflects the ripple effect of the initial spending in the economy (often derived from national or local economic data, e.g., 1.5 or 1.7).

Indirect and induced impacts are incorporated through the multiplier.

In the study by Baade and Matheson (2004), the economic impact of the 1994 FIFA World Cup in the United States was estimated using an I-O model with the following simple steps:
- Step 1: Estimate direct spending. The authors collected data on expenditures from sources such as tourists, organizers, athletes, media, etc. The total direct spending was estimated at approximately 623 million USD.
- Step 2: Apply the multiplier. The multiplier used ranged from 1.5 to 1.7, depending on the economic conditions of each host city. This multiplier reflects the ripple effect of the initial spending in the economy.

Total economic impact = Direct spending × multiplier
- Step 3: Calculate total economic impact. Applying an average multiplier of 1.6 yields: 623 million USD × 1.6 = 996.8 million USD.

This is the total estimated economic impact of the event according to the I-O model.

- Step 4: Adjust for bias factors. The authors emphasized that the above figure could be exaggerated due to:

Substitution effect*:* Local residents may have simply shifted their spending to the event rather than added new spending.

Leakage*:* A significant portion of the revenue leaked out of the host cities (going to sponsors or non-local entities).

After accounting for these factors, only 2 out of 9 host cities experienced clearly significant real economic growth, while the others saw virtually no notable net impact.

Baade and Matheson (2004) concluded that although the 1994 FIFA World Cup was one of the largest international sports events ever held in the United States, their findings showed:
- The actual economic impact of the event was much lower than expected.
- Of the 9 host cities, only 2 recorded a truly significant increase in GDP related to the event, while the other cities experienced almost no significant net economic effect.
- Initial estimates using the I-O model suggested a total economic impact of over 900 million USD, but after removing substitution and leakage effects, the actual figure was considerably smaller.

The main reasons for the overestimation were identified as:
- Substitution effect: Local residents spent money at the event instead of on other activities, meaning no new spending was introduced.
- Economic leakage: A large portion of the revenue ended up in the hands of sponsors and external parties outside the local area.
- Rigid assumptions of the I-O model: The model's fixed coefficients failed to account for dynamic changes in the economy.

Therefore, the use of the I-O model needs to be carefully adjusted when evaluating sports events; otherwise, it can easily lead to an overestimation of economic impact, which in turn may misinform public investment decisions and sports-tourism development policies.

Cost–benefit analysis (CBA) model

The CBA model is an economic tool used to compare the costs and benefits of a program, project, or event to assess its economic efficiency. In the context of sports events, CBA is often applied to consider:
- Total investment costs: Including costs for constructing or upgrading infrastructure, organization and operation costs, security, marketing, etc.

- Total economic benefits: Including revenue from tourism, GDP growth, tax revenues, job creation, enhanced national image, etc.

The basic formula of the CBA model is:

Net benefit = Total benefits − total costs

And the benefit–cost ratio (BCR) is:

BCR = Total benefits/total costs

Interpretation:

- If BCR > 1 → The project/event is economically efficient (benefits exceed costs).
- If BCR < 1 → The project/event is not economically efficient and should be reconsidered.

In their study, Lee and Taylor (2005) used the CBA model to evaluate the economic efficiency of hosting the 2002 FIFA World Cup in South Korea and Japan. The calculation was presented through the following steps:

- Step 1: Calculate total costs. This includes:
  +Building or renovating stadiums and transportation infrastructure.
  + Organization and operation expenses, security, opening and closing ceremonies.
  +Marketing expenses and national image promotion.
  +Total estimated cost: about 4.6 billion USD.
- Step 2: Estimate total benefits. This includes:
  + Revenue from ticket sales, broadcasting rights, and sponsorships.
  + Increase in international tourism during the event period.
  + Spillover effects on national branding and tourism after the event.

Total estimated benefits: about 5.1 billion USD.

- Step 3: Calculate net benefit and BCR.
  + Net benefit = 5.1 billion – 4.6 billion = 0.5 billion USD.
  + BCR = 5.1/4.6 ≈ 1.11 (for South Korea).

Because BCR > 1, from an economic perspective, the 2002 World Cup had a positive net effect. However, the net benefit was quite modest when long-term legacy factors were excluded.

Lee and Taylor emphasized that for a sports event to serve as a "lever for economic development," there must be an effective post-event exploitation plan in place, rather than relying solely on immediate revenues.

By applying the CBA model, Lee and Taylor (2005) showed that the 2002 FIFA World Cup in South Korea and Japan did yield a positive net economic benefit, but the extent of the benefit was not as high as initially expected. The main conclusions of their analysis include:

- The BCR was only around 1.1, indicating that while the event was economically beneficial, the magnitude of the benefit was not large when considered in the short term.
- A large portion of the economic benefits stemmed from non-financial factors such as improved national image, greater international tourism visibility, and infrastructure development.
- Without a long-term strategy, facilities built for the event can end up underutilized, becoming financial burdens rather than sources of profit.

In summary, hosting a major sports event like the World Cup is only truly economically effective when accompanied by comprehensive long-term planning and a sustainable strategy to leverage the event's legacy.

Social accounting matrix (SAM) model

The SAM is a macroeconomic analysis tool extended from the I-O model, developed to reflect all economic flows in a national or regional economy. SAM allows for:

- Detailed analysis of the relationships between production sectors, households, government, investment, foreign trade, and factors of production.
- Evaluation of economic impacts by population group, region, industry, and income level, rather than just by industry as in the I-O model.
- The strength of the SAM model lies in its ability to assess income distribution and broad socio-economic spillover effects, which are particularly useful for large sports events with wide-ranging impacts.
- Its analytical approach is similar to the I-O model but is expanded to include household incomes, fiscal policy effects, and financial flows.

In the report "Economic Impact of Major Sporting Events" (OECD, 2021), the OECD recommends using the SAM to evaluate the indirect and induced impacts of major sports events, highlighting this model's effectiveness in the case of the 2012 London Olympics. Specifically:

- Initial public expenditure for the London 2012 Olympics (direct injection): approximately £9 billion.
- Results from the SAM model showed:
  - Regional spillover of impact: About 70% of the economic impact was concentrated in London, with the remaining 30% spreading to other regions of the UK.
  - Income distribution effects: A strong increase in the incomes of low-skilled labor groups in sectors such as construction, security, and hospitality (largely due to Olympic-related projects and jobs).
  - Fiscal impact: Income tax and consumption tax revenues rose by roughly £0.5–0.7 billion during the year of the event.
- OECD's conclusion: Relying only on an I-O model or a CBA analysis would not capture the depth of social effects

and income distribution impacts that the SAM model can reveal.

Legacy evaluation model

The legacy evaluation model is a tool aimed at measuring and analyzing the long-term impacts of major sports events (mega-events) on the host nation or city. Unlike short-term impact models such as I-O or CBA, this model focuses on:

- Sustainable changes that persist after the event.
- Non-financial effects such as national image, social capital, and institutional improvements.

According to Preuss (2007), "legacy" refers to the changes that remain after an event concludes and that can affect the economic, social, and environmental aspects of the host community. Preuss categorizes legacy into seven groups: economic, infrastructure, sports, social–cultural, political–administrative, branding, and environmental. The extent of a legacy depends on comprehensive planning, effective post-event strategy, coordination among stakeholders, and community participation.

Factors influencing the extent of an event's legacy include:

- A well-defined post-event development strategy.
- Initial master planning, especially for infrastructure development and long-term utilization of facilities.
- Inter-sectoral coordination between the government, the private sector, and community stakeholders.
- The level of local resident participation and support.

Key conclusions from research on event legacy indicate:

- Hosting a large sports event does not automatically create positive long-term value.
- Legacy only has real value when it is deliberately planned, managed, and leveraged properly.
- Event organizers and local authorities should integrate legacy evaluation as an essential component of their strategy when bidding for and hosting a sports event.

Multiplier model analysis

The multiplier model for economic impact analysis is used to estimate the total economic impact of a sports event by multiplying the direct spending by a multiplier that reflects how the initial spending generates additional value in the economy.

Formula:

$$\text{Total Impact} = \text{Direct spending} \times \text{multiplier}$$

In which:

- Direct spending: the amount of money spent by parties related to the event, including:
  - *Tourists:* expenditures on tickets, accommodation, food, shopping, etc.
  - *Organizers:* costs for venue rental, personnel, media, logistics, etc.
  - *Participants (athletes, media, sponsors):* various expenses incurred in relation to the event.

This direct spending can be measured through surveys or financial data.

- Economic multiplier: an index reflecting the extent of the ripple effect of the initial spending within the economy. It encompasses:
  - Indirect impacts: For example, a hotel purchases food from local suppliers to serve guests (additional demand for local businesses).
  - Induced impacts: For example, hotel employees spend their wages on other goods and services in the local economy.
  - The multiplier value depends on the characteristics of the local economy:
  - In large urban centers, the multiplier is usually higher (e.g., 1.5–1.8).
  - In rural areas or weaker economies, the multiplier tends to be lower (e.g., 1.1–1.3).

Daniels (2007) applied the multiplier model to analyze the economic impact of amateur sport events held in small communities. The study emphasized the role of geographic location and community size in determining the spillover effects of visitor spending. The key results of the study showed:

- Even small events can generate significant economic impact in localities that have few other spending opportunities, due to a low substitution effect.
- In one regional sports event in North Carolina, direct spending was about $2.6 million, and the multiplier used was 1.45, resulting in a total economic impact of nearly $3.8 million.
- The author noted that peripheral or rural areas may benefit more clearly, as the event-related spending is not as dispersed or subject to leakage as it might be in large cities.

Another study by Burgan and Mules (2001) compared the cost–benefit approach and the multiplier model in measuring the economic impact of sport tourism events. They applied the multiplier model to estimate tourist spending at sports events in Australia and assessed the events' impact on local GDP and employment. The main findings from their study were as follows:

- A state-level sports event in Adelaide was examined with direct spending of around 10 million AUD.
- The multiplier applied was 1.6, leading to a total economic impact of approximately 16 million AUD.
- However, using a CBA approach, the net benefit after subtracting the event's organizational costs was only about 5 million AUD, demonstrating a significant difference between the two approaches.

The authors concluded that while the multiplier model is easier to use, it can result in a biased evaluation if one does not take into account the costs and leakage of spending.

CONCLUSION

This paper has systematized the theoretical foundations related to the impact of sports events on the economy and clarified the various impact aspects and models commonly used in such evaluations. In the context of sports being increasingly viewed as a sector capable of generating tangible economic value, strengthening the theoretical foundation not only serves research purposes but also helps guide development policy. The content presented in this paper provides an important basis for enhancing analytical capabilities and formulating solutions for sports development associated with economic growth. This also creates opportunities for localities to effectively leverage sports events as a component of their sustainable development and integration strategies.

Furthermore, the paper contributes to expanding the research perspective in an interdisciplinary direction, connecting sports, economics, and public management. The synthesis of measurement models and the theoretical analytical framework presented is not only of academic reference value, but can also be applied in empirical studies to develop assessment tools suited to the practical conditions of Vietnam.

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Review Article

Analysis of the economic impact of sport event in Ho Chi Minh City during the period 2021–2024

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ABSTRACT

This article analyzes the economic impact of sports events organized in Ho Chi Minh City during the period 2021–2024. Based on data from 14 representative sports events, the study applies a direct spending model combined with an economic multiplier to estimate the total economic impact. The findings indicate that total direct spending reached approximately 18.45 million USD, while the estimated overall economic impact amounted to 27.67 million USD. These results demonstrate that sports not only affirm their cultural and social role but also reveal their potential to develop as a soft economic sector, contributing to the promotion of consumption, tourism, and urban services. The study provides practical evidence to support policy-making for sports development in connection with local economic growth.

Keywords: Analysis, Direct spending, Economic impact, Ho Chi Minh City, Multiplier effect, Sports events

INTRODUCTION

In the context of modern urban areas constantly seeking sustainable development drivers, sports are increasingly recognized as a sector capable of generating practical economic value, beyond their traditional roles in public health and community culture. Sports events, particularly large-scale tournaments and mass participation activities, play a dual role: Promoting healthy lifestyles and generating substantial economic flows through consumption, tourism, services, and media.

Ho Chi Minh City (HCMC), the largest economic center in Vietnam, has emerged in recent years as a national leader in organizing a wide variety of sports events in terms of both scale and format. From international marathons and community activities such as the "Olympic Run Day for Public Health" to innovative nighttime races, the city not only demonstrates professional organizational capacity but also shows strong potential for developing an urban sports economy.

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However, despite the increasing number and scale of sports events, a comprehensive and systematic evaluation of their economic impact remains largely absent in both research and practice in Vietnam. The current assessments mostly focus on participant counts, media reach, or organizational success, without delving into concrete analyses of contributions to economic sectors such as accommodation, food and beverage, transportation, event services, or media and sponsorship investments. This gap highlights the urgent need for quantitative research based on real-world data to more clearly define the economic role of sports events at the local level.

In response to this reality, this paper aims to analyze the economic impact of sports and physical activity (SPA) events in HCMC during the period 2021–2024. By compiling and processing data from organized sports events, the study seeks to quantify their economic effects. The findings not only clarify the economic potential of sports but also provide a practical basis for more effective policy-making, investment, and event planning in the city going forward.

THEORETICAL OVERVIEW

Over the past decades, SPA events have been recognized by researchers and policymakers as strategic tools for promoting

socioeconomic development in host cities and regions. Beyond their cultural and spiritual value, SPA events – especially those of medium and large scale – generate substantial cash flows through consumption, tourism, commerce, media, and infrastructure investment (Crompton, 1995; Muguerza *et al*., 2021).

The economic impact of sports events is commonly analyzed through a three-tier spending model: Direct spending, indirect spending, and induced spending. This framework underpins the economic multiplier approach, a widely adopted quantitative method used to measure the ripple effects of initial expenditures on the local economy (Jago and Dwyer, 2006). According to these authors, direct spending includes expenditures by participants, athletes, organizers, and sponsors, while subsequent spending rounds help redistribute income and stimulate household consumption within the community.

The economic impact of SPA events is typically assessed across three main levels: Direct impact, indirect impact, and induced impact (Crompton, 1995). Based on this foundation, various analytical models have been developed to quantify the economic value generated by events. The most commonly used models include:

- Input–output (I–O) model: A classical tool used to estimate economic spillover effects by multiplying direct spending with input–output coefficients (Leontief model). However, this model assumes fixed production relationships and does not account for substitution effects or monetary leakages (Baade and Matheson, 2004).
- Multiplier model: A simple and easy-to-apply method commonly used in local-level studies or for medium- and small-scale events. Nevertheless, if leakage factors or organizational costs are not properly adjusted, the results may be overstated (Daniels, 2007; Burgan and Mules, 2001).
- Cost–benefit analysis: A comprehensive approach comparing the total costs and total socioeconomic benefits of an event. In the study by Lee and Taylor (2005), while the 2002 FIFA World Cup in South Korea and Japan yielded a net benefit, the benefit–cost ratio was only 1.1, suggesting limited economic efficiency without considering long-term legacy impacts.
- Social accounting matrix model: An expanded version of the I–O model that enables the evaluation of income distribution and impact across population groups and sectors. The OECD (2021) recommends applying this model to large-scale events such as the olympics to deeply analyze social and budgetary effects.
- Legacy evaluation model: Developed by Preuss (2007), this model focuses on long-term impacts, both tangible and intangible. A legacy only realizes its value if it is strategically planned, managed, and leveraged after the event.
- In addition to measurement models, many scholars emphasize the necessity of a critical perspective. Crompton (1995) and Matheson (2006) caution that studies funded by governments or stakeholders may overstate results. Factors such as substitution effects, spending leakages, and fixed assumptions in models should be rigorously controlled to avoid distortions in policy conclusions.

A meta-analysis conducted by McFarland (2017) across 46 quantitative studies found that the multiplier effect is one of the most influential variables in determining the total economic impact of sports events. Additionally, local population size and event scale were identified as two core factors influencing economic effectiveness. However, the study also emphasized that not all economic impact assessments accurately reflect the true value of the events. Both Crompton (1995) and Matheson (2006) warned that studies funded by governments or influenced by political interests may be prone to result in inflation. Factors such as substitution effects, leakages, or short-term impact assessments can lead to significant distortions if not properly controlled.

Beyond short-term evaluation models, an increasingly relevant approach is the study of event legacy. This concept suggests that sports events not only create immediate economic impacts but also leave long-term values in terms of infrastructure, organizational capacity, local image, and community sports development. Hughes *et al*., (2010) categorized legacy into dimensions such as education, social capital, human resources, and sports culture – all of which contribute to strengthening the host city's competitiveness and attractiveness.

In the context of Vietnam, the study by Viet *et al*., (2018) represents one of the few domestic efforts to quantitatively evaluate the economic impact of a specific sports event through field surveys. Their research employed a detailed questionnaire divided into two parts: (1) Participant spending by category (e.g., tickets, food and beverage, accommodation, transportation, entertainment) and (2) demographic information. The survey findings showed that such expenditures contributed to creating new financial inflows for HCMC, especially in the tourism and service sectors. The study also recommended policy adjustments to better attract high-spending visitor segments – demonstrating strong practical relevance for urban sports event planning in large cities like HCMC.

Based on the above theoretical and empirical foundations, it is evident that evaluating the economic impact of sports events requires a quantitative, systematic approach rooted in the specific local context. This article builds upon those approaches and applies them to the case of HCMC from 2021 to 2024, with the aim of contributing scientific evidence to guide the development of sports as an effective and sustainable urban economic sector.

RESEARCH METHODOLOGY

This study employs a quantitative approach combined with a positivist economic model to evaluate the economic impact of SPA events held in HCMC during the period 2021–2024. The primary method applied is the economic impact analysis using the multiplier model, aimed at quantifying the economic effects derived from the direct spending associated with SPA events.

Research Design

The study was conducted through a four-step process:

- Data compilation and event classification: SPA events that took place in HCMC from 2021 to 2024 were identified and categorized based on data provided by the HCMC Department of Culture and Sports and event reports from related organizations.
- Estimation of direct spending: Based on data on participant numbers, revenues from sponsorship, advertising, and ticket sales, the total direct spending generated by each event was estimated.
- Selection and application of economic multiplier: The multiplier was chosen within the range of 1.5–1.7, based on previous studies in developed urban areas (Daniels, 2007; McFarland, 2017; OECD, 2021).
- Calculation and analysis of economic impact: The total economic impact was calculated using the formula:

$$\text{Total Economic Impact} = \text{Direct Spending} \times \text{Multiplier}$$

Scope of the Study

Due to the absence of comprehensive surveys for each event, several assumptions (e.g., average spending levels, multiplier values) were made during the estimation process, which may affect the accuracy of the results. Nevertheless, the analyses presented in this study provide reliable scientific insights that can support policy formulation and strategic planning for future SPA event organization.

- Time scope: The selected SPA events were held between 2021 and 2024.
- Data scope: Due to limitations in data availability and research resources, the study collected only basic statistical indicators such as number of participants, ticket revenues, and income from sponsorship and advertising.

In this study, the author employs an exchange rate of 23,000 VND/USD to convert values from Vietnamese dong into U.S. dollars. The selection of this rate is based on the average level during the 2021–2024 period, when the USD/VND exchange rate fluctuated between 22,800 and 24,500 VND/USD. Using a fixed exchange rate ensures consistency in comparing events across multiple years, while still reflecting the general trend of the foreign exchange market. This approach is also consistent with international practice in economic impact studies of sports events, where the objective is not to forecast exchange rates but to standardize data for analytical purposes.

RESEARCH RESULTS

Statistics of Sports Events Held in HCMC during the period 2021–2024

During the 2021–2024 period, HCMC hosted numerous large-scale SPA events, ranging from international marathons to mass participation events such as the "Olympic Run Day for Public Health." A total of 14 major SPA events were recorded in this study, with detailed data on the number of participants and key revenue sources.

The number of participants increased steadily each year. In 2021 – still affected by the aftermath of the COVID-19 pandemic – the number of events was limited, attracting around 10,000 participants. However, from 2022 onward, as the economy and society began to recover, both the number and scale of events expanded significantly. Nearly 50,000 participants were recorded in 2022, increasing to 66,000 in 2023 and reaching 72,000 in 2024.

Key events during this period include:

- HCMC Techcombank International Marathon (2021, 2022, 2023, 2024)
- Olympic Run Day for Public Health (2022, 2023, 2024)
- HCMC Marathon – Salonpas HCMC Marathon (various years)
- VnExpress Midnight Marathon and other night races.

From an organizational perspective, these events were jointly coordinated by the HCMC Department of Culture and Sports, national sports federations, corporate sponsors, and media partners. Overall, the event system during this period was not only diverse in format but also increasingly professionalized in terms of scale, participant numbers, media coverage, and logistics.

Table 1 presents summarized statistics showing that HCMC consistently organized large-scale SPA events – particularly international marathons and Olympic Run Days – with regular frequency each year. During the 2021–2024 period, two main categories of events emerged: Branded international marathons (Techcombank, Salonpas, VnExpress) and mass participation community activities like the Olympic Run Day.

In terms of participation scale, the Olympic Run Day events attracted a very large number of participants – averaging around 30,000 people annually – demonstrating the strong social impact of community-based SPA activities. Meanwhile, international marathons such as the Techcombank and VnExpress Marathons consistently attracted between 10,000 and 15,000 participants, reflecting the high level of professionalism and appeal of these competitive events.

Table 1: Statistics on Sports events in HCMC during the period 2021–2024

TT	Event name	Date held	Number of participants	Ticket revenue (USD)	Sponsorship revenue (USD)	Advertising revenue (USD)
1	The 4th HCMC Techcombank International Marathon	April 11, 2021	13.117	855.457	85.546	42.773
2	The 8th HCMC Marathon – Salonpas HCMC Marathon 2021	January 16, 2021	10.000	652.174	65.217	32.609
3	HCMC Techcombank International Marathon 2022	December 09, 2022	12.000	782.609	78.261	39.130
4	Olympic Run Day for Public Health 2022	March 27, 2022	30.000	521.739	52.174	26.087
5	The 9th HCMC Marathon – Salonpas HCMC Marathon 2022	April 16, 2022	7.500	489.130	48.913	24.457
6	VnExpress Marathon HCMC Midnight 2023	February 12, 2023	11.000	717.391	71.739	35.870
7	Olympic Run Day for Public Health 2023	March 26, 2023	30.000	521.739	52.174	26.087
8	HCMC Techcombank International Marathon 2023	December 10, 2023	15.000	978.261	97.826	48.913
9	The 10th HCMC Marathon – Salonpas HCMC Marathon 2023	January 08, 2023	10.000	652.174	65.217	32.609
10	VPBank VnExpress Marathon HCMC Midnight 2024	March 03, 2024	11.000	717.391	71.739	35.870
11	Olympic Run Day for Public Health 2024	March 24, 2024	30.000	521.739	52.174	26.087
12	HCMC Techcombank International Marathon 2024	December 08, 2024	15.000	978.261	97.826	48.913
13	District 1 Midnight Run 2024	October 11, 2024	6.000	391.304	39.130	19.565
14	The 11th HCMC Marathon– Salonpas HCMC Marathon 2024	January 14, 2024	10.000	652.174	65.217	32.609

HCMC: Ho Chi Minh City

In terms of revenue, the Techcombank HCMC International Marathon recorded the highest figures, with annual ticket sales reaching up to VND 22.5 billion, accompanied by VND 2.25 billion in sponsorship and VND 1.125 billion in advertising – clearly demonstrating the economic potential of commercially driven and internationally branded SPA events.

The detailed statistics on participation, revenue, and event inputs serve as a critical foundation for the economic impact assessment, which is presented in the following section.

The Economic Impact of Sports Events in HCMC during the Period 2021–2024

To assess the economic impact of SPA events in HCMC, this study compiled data from 14 major events held during the 2021–2024 period. The key indicators analyzed include event revenue (from ticket sales, sponsorships, and advertising), additional spending by participants, total direct spending, and total economic impact after applying the multiplier effect.

The total direct spending was calculated using the formula:

Total Direct Spending = Event Revenue + Additional Participant Spending

In which:

Additional Participant Spending = Number of Participants × Average Spending per Person

With an assumed average expenditure of approximately 43.5 USD per participant, this formula allows for the estimation of the total direct cash flow generated by each event.

The total economic impact was then estimated using the multiplier model:

Total Economic Impact = Total Direct Spending × Multiplier

Table 2: Summary of the economic impact of sports events in Ho Chi Minh City during the period 2021–2024

Year	Total revenue (USD)	Additional spending (USD)	Total direct spending (USD)	Total economic impact (USD)
2021	750.000	434.783	1.184.783	1.777.174
2022	2.062.500	2.152.174	4.214.674	6.322.011
2023	3.300.000	2.869.565	6.169.565	9.254.348
2024	3.750.000	3.130.435	6.880.435	10.320.652
Total	9.862.500	8.586.957	18.449.457	27.674.185

In this study, the multiplier was set at 1.5, appropriate for a major urban area with a well-developed service network like HCMC.

The results are presented in Table 2, which summarizes the key economic indicators of SPA events in HCMC between 2021 and 2024, including total event revenue, additional participant spending, total direct spending, and total estimated economic impact (using a multiplier of 1.5).

In 2021, a period still affected by the COVID-19 pandemic – total revenue reached only about 750,000 USD, with a limited number of participants. However, when adding approximately 434,783 USD of additional spending by participants, the total direct expenditure of the events amounted to 1.18 million USD, and when applying an economic multiplier of 1.5, the overall economic impact was estimated at 1.78 million USD.

Moving into 2022, events were strongly revived with total revenue increasing to 2.06 million USD, and additional spending reaching around 2.15 million USD. As a result, the total direct expenditure rose to 4.21 million USD, generating an estimated economic impact of 6.32 million USD – nearly 3 times higher than in 2021.

2023 marked an impressive growth phase with total direct expenditure amounting to 6.17 million USD, mainly driven by large-scale tournaments that attracted a significant number of spectators and sponsors. The economic impact in this year was estimated at 9.25 million USD, further demonstrating the substantial spillover effects of the sports event industry.

By 2024, total revenue reached the highest level in the period at 3.75 million USD, combined with 3.13 million USD in additional spending by participants, resulting in a total direct expenditure of 6.88 million USD. Applying the multiplier effect, the total estimated economic impact reached 10.32 million USD, making it the year with the highest economic contribution in the entire period.

The statistical results presented in Table 2 indicate that during the period 2021–2024, sports events in HCMC generated a total revenue of approximately 9.86 million USD, including income from ticket sales, sponsorships, and advertising. In addition, it is estimated that there was about 8.59 million USD of supplementary spending by participants – an expenditure not directly channeled through the organizers but playing a significant role in stimulating the local service economy.

As a result, the total direct expenditure reached 18.45 million USD, reflecting the substantial scale of cash flows circulating in the urban economy through sports. When applying an economic multiplier of 1.5, the overall economic impact in the community was estimated at 27.67 million USD. This figure not only highlights the role of sports events as cultural and social activities but also demonstrates the feasibility of considering sports as a soft economic sector capable of stimulating consumption, attracting investment, and generating momentum for other service industries such as tourism, hospitality, food services, and media.

The 4-year aggregate also illustrates a consistently upward trend, with each year's economic impact exceeding that of the previous one. This suggests strong potential for HCMC to strategically develop and leverage SPA events as part of its long-term urban economic development strategy, integrating sports and culture.

Overall, the data affirm that SPA events in HCMC are increasingly proving their value as effective catalysts for urban economic stimulation, particularly through the promotion of service consumption, tourism, advertising, and the attraction of corporate sponsorship. The steady annual growth underscores the potential of sports to evolve into a dynamic economic sector in the future.

CONCLUSION

The research results indicate that sports events organized in HCMC during the period 2021–2024 generated a total direct expenditure of approximately 18.45 million USD and an estimated overall economic impact of more than 27.67 million USD. The expenditures include both revenues from event organization and additional participant spending, reflecting the actual cash flows injected into the local economy through sports events.

The stable growth trend over the years demonstrates that sports are not merely community activities but also an effective tool for stimulating consumption, developing services, attracting

sponsorship, and promoting urban branding. Particularly, large-scale and professionally organized events have increasingly shown clear economic effectiveness.

This study contributes to clarifying the economic role of sports in modern urban development, while also providing practical evidence for HCMC to further leverage SPA events as a soft economic sector in its sustainable development strategy – integrating culture, sports, tourism, and services.

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Research Article

Political influence and geopolitics in Olympic bidding: An analysis of international Olympic committee's voting patterns

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ABSTRACT

This research investigates the role of political influence and geopolitical dynamics in the International Olympic Committee's (IOC) selection of host cities for the Olympic Games. Analyzing voting patterns from 1988 to 2024, the study reveals that decisions are frequently shaped not only by technical merits but also by bloc voting, diplomatic relations, and strategic alliances among IOC members. Using a mixed-methods approach combining quantitative data analysis and qualitative insights from IOC documents and interviews, this paper provides critical insights into the political nature of Olympic bidding. Recommendations are proposed to enhance transparency and fairness in the host city selection process.

Keywords: Geopolitics, Host city selection, International sport, International Olympic committee voting, Mega-events, Olympic bidding, Political influence

INTRODUCTION

The Olympic Games stand as a global symbol of unity, excellence, and international cooperation, attracting billions of viewers and showcasing the cultural and athletic prowess of host nations. Beyond its sporting appeal, the process of selecting a host city for the Olympic Games has emerged as a highly strategic and politically charged endeavor. Hosting the Olympics offers nations an opportunity to project soft power, boost tourism, stimulate economic growth, and enhance their international standing. Consequently, cities vying for the right to host the Games engage in complex campaigns, often supported by extensive governmental backing, diplomatic lobbying, and strategic alliances.

While the International Olympic Committee (IOC) maintains that the bidding process is grounded in objective technical assessments, historical evidence and academic studies suggest that political considerations often exert a profound influence on final outcomes. IOC members, each representing different national interests, may be swayed by geopolitical factors such as regional solidarity, historical alliances, or reciprocal diplomatic arrangements. The phenomenon of bloc voting, where groups of countries support candidates from within their region or political sphere, further underscores the political undertones of the selection process. This research paper aims to explore how political influence and geopolitical dynamics shape the IOC's decision-making in selecting Olympic host cities. Focusing on voting patterns between 1988 and 2024, this study examines instances where political factors overshadowed technical merits, affecting the final outcome. Through a combination of quantitative data analysis and qualitative examination of bid processes, official documents, and expert interviews, this paper seeks to uncover the underlying political mechanisms that drive Olympic host city selections.

Understanding these dynamics is crucial for evaluating the fairness and transparency of the IOC's selection process. By analyzing key case studies and voting data, the study offers insights into the evolving nature of Olympic bidding and raises important questions about the extent to which political influence should be curtailed to preserve the integrity of the

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Games. Ultimately, the paper seeks to provide actionable recommendations for reforming the process to ensure that future selections reflect the true spirit of the Olympic Movement—neutrality, equity, and global unity.

LITERATURE REVIEW

The academic discourse surrounding the Olympic Games has evolved significantly, particularly in relation to the politics of bidding and the selection of host cities. Early scholarship often emphasized the economic and infrastructural aspects of hosting mega-events (Preuss, 2004), but more recent research has shifted focus toward the intricate web of political, diplomatic, and geopolitical factors influencing IOC decisions. One of the foundational studies in this area is Toohey and Veal's (2007) exploration of political lobbying in Olympic bidding. They argue that cities with strong governmental backing and international support networks have a marked advantage, regardless of their technical capabilities. Chappelet and Kübler-Mabbott (2008) extend this argument, suggesting that the IOC's governance structure itself facilitates political maneuvering, as each country holds equal voting power, allowing bloc voting and strategic alliances to flourish. Grix and Lee (2013) introduce the concept of soft power, contending that nations leverage cultural appeal, diplomatic ties, and international partnerships to enhance their Olympic bids. This soft power approach, they argue, often overshadows practical considerations such as transportation infrastructure or environmental sustainability. Their analysis is particularly relevant when examining the success of bids like London 2012 or Tokyo 2020, both of which benefited from extensive diplomatic engagement and global branding campaigns.

Boykoff (2016) and Zimbalist (2015) add a critical perspective, focusing on the intersection of political economy and mega-event hosting. They contend that the IOC, despite its claims of neutrality, frequently succumbs to the pressures of global politics. For example, Beijing's successful bids for the 2008 and 2022 Olympics highlight how geopolitical influence and economic leverage can outweigh democratic values and human rights concerns in the selection process. Furthermore, the implementation of Olympic Agenda 2020 was intended to reform the host city selection process by increasing transparency and sustainability. However, critics argue that these reforms have only modestly curbed the influence of political lobbying (Gaffney, 2017). The withdrawal of several democratic nations from recent bidding contests, citing cost concerns and lack of public support, has left the field open to countries with centralized political systems and robust diplomatic strategies. Taken together, the literature reveals a persistent tension between the IOC's stated commitment to impartiality and the political realities of international sport. The host city selection process has become a battleground where technical excellence, diplomatic acumen, and geopolitical strategy converge. This review underscores the necessity for further empirical investigation into how these forces interact and influence IOC voting behavior—an inquiry this paper aims to pursue through detailed data analysis and case-based examination.

METHODOLOGY

A mixed-methods approach was adopted:

- Quantitative analysis: IOC voting data from 1988 to 2024 were compiled, focusing on voting rounds, regional patterns, and candidate city elimination.
- Qualitative analysis: Content analysis of official bid books, IOC reports, and scholarly interviews with former IOC members.
- Case studies: In-depth reviews of key bidding processes, including Beijing 2008, London 2012, and Tokyo 2020.

Data were triangulated to identify correlations between voting behavior and geopolitical dynamics.

RESULTS

Analysis of IOC voting data from 1988 to 2024 reveals several recurring patterns:

The above Table 1 highlights the consistent influence of regional solidarity and bloc voting.

IOC Bloc Voting Chart

The figure illustrates the dominance of bloc voting, with Asia, Europe, and Latin America emerging as pivotal influencers in recent decades.

DISCUSSION

The findings of this study affirm the integral role that political influence and geopolitical dynamics play in the Olympic bidding process. The evidence of consistent bloc voting, as presented in the results, points to the prevalence of informal political agreements and regional solidarity over technical assessments. Such practices challenge the IOC's stated mission of promoting neutrality and merit-based evaluation in its host city selection process. One key observation is the increasing prominence of emerging economies and politically influential states in securing Olympic bids. China's success with the 2008 Games and again with the 2022 Winter Olympics demonstrates the strategic use of economic power, diplomacy, and media narratives to shape international opinion and gain IOC support. Similarly, Japan's Tokyo 2020 campaign was supported by an orchestrated regional effort and leveraged Japan's strong global relationships and stability narrative to win over IOC voters. The African bloc's strategic role as a swing vote illustrates

Table 1: Regional Bloc Support in Selected Olympic Host City Elections

Year	Host City	Key Rivals	Regional Bloc Support Observed	Final Vote Margin
2008	Beijing	Toronto, Paris	Asia-Africa Solidarity	56–22
2012	London	Paris, Madrid	Western European Division	54–50
2016	Rio de Janeiro	Madrid, Chicago	Latin America+Africa	66–32
2020	Tokyo	Istanbul, Madrid	Asian Regional Push	60–36
2024	Paris	Los Angeles	EU Bloc Consensus	95–0*

*: 2024 was a pre-arranged dual award with LA assigned 2028.

how regions with fewer direct bids can still exert significant influence. This often results in diplomatic negotiations in which bidding cities and nations promise development aid, sporting infrastructure investment, or reciprocal voting support in return for bloc allegiance. While this might benefit underdeveloped regions in the short term, it creates a long-term credibility issue for the IOC. In addition, the reliance on backroom diplomacy and informal agreements poses transparency concerns. The example of Paris 2024 and Los Angeles 2028, awarded simultaneously in an unprecedented move, hints at increasing efforts to manage political pressure while minimizing the damage to IOC's credibility. Although the dual award avoided the spectacle of a head-to-head contest, it also sidestepped an open competitive process. In essence, the evidence suggests that the Olympic bidding process is less about which city is most prepared to host the Games and more about which city is best able to navigate the IOC's political landscape. This raises fundamental questions about the nature of global sports governance and the future of mega-events in a politically polarized world.

Recommendations for Future Work

Strengthen transparency mechanisms

Future research should examine how independent auditing and public reporting can make IOC voting more transparent, thereby reducing opportunities for opaque political bargaining.

Evaluate the role of lobbying regulations

Studies should assess the effectiveness of formal lobbying restrictions in curbing undue political influence during the bidding process.

Explore digital diplomacy in bidding

With the rise of social media, future research could analyze how nations use digital platforms to influence perceptions of their bids and mobilize international support.

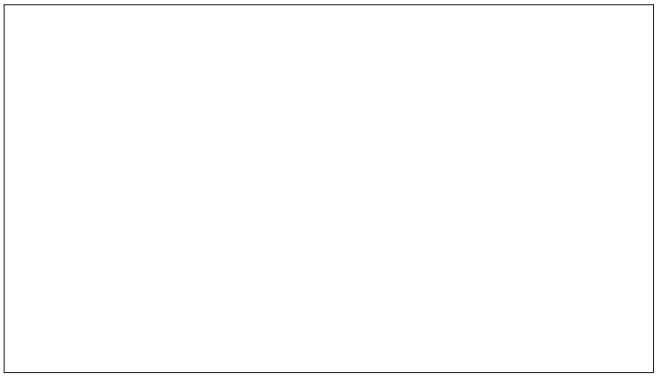

Figure 1: International Olympic committee's voting bloc influence by continent (1988–2024)

Investigate regional voting blocs

Detailed analysis of regional solidarity (e.g., African, Asian, or European blocs) in IOC voting patterns could reveal how alliances shape outcomes.

Examine soft power strategies

Scholars should further investigate how cultural diplomacy, international aid, or global media campaigns are employed by candidate cities to gain political favor.

Assess the impact of IOC reforms

Future studies should evaluate whether initiatives like Olympic Agenda 2020 and New Norms have meaningfully reduced geopolitical influence in host city selection.

Longitudinal studies on IOC membership

Research could track the voting behavior of IOC members over time to determine whether personal, national, or regional loyalties dominate their decision-making.

ASE studies on emerging economies

Comparative case studies of bids from countries such as China, Brazil, or India could reveal how rising powers leverage geopolitical positioning to secure Olympic hosting rights.

Gender and diversity in IOC decision-making

Future work could analyze whether greater diversity within the IOC (in terms of gender, region, and professional background) alters the balance of political influence.

Economic versus political drivers

Scholars should investigate the interplay between economic capabilities (infrastructure, financial guarantees) and political leverage in determining bidding success.

Role of mega-event diplomacy

Research could explore how Olympic bidding overlaps with a nation's broader foreign policy agenda, trade agreements, and international image-building.

Impact of simultaneous hosting awards

The dual awarding of Paris 2024 and Los Angeles 2028 warrants deeper study to assess whether such practices enhance fairness or simply shift political negotiations behind closed doors.

Predictive modeling of voting outcomes

Developing quantitative models that incorporate geopolitical, economic, and technical factors could provide new insights into the predictability of IOC decisions.

Comparative analysis with other mega-events

Cross-event comparisons (e.g., FIFA World Cup, Expo bids) could help identify whether patterns of geopolitical influence in Olympic bidding are unique or part of a broader trend in global event governance.

Public perception and legitimacy studies

Future research should investigate how citizens in both winning and losing nations perceive the fairness of IOC decisions, and how perceptions of legitimacy affect public trust in the Olympic Movement.

CONCLUSION

The analysis of Olympic bidding from 1988 to 2024 demonstrates that the selection of host cities has been consistently shaped by political influence, regional solidarity, and geopolitical maneuvering, rather than by objective technical merit alone. While the IOC officially emphasizes neutrality, fairness, and merit-based decision-making, voting patterns and case studies reveal that bloc voting, diplomatic lobbying, and soft power strategies frequently override technical evaluations. The study highlights that hosting the Olympics is far more than a logistical or infrastructural challenge; it is a contest of international politics, where states seek to consolidate global visibility, strengthen alliances, and project national prestige through the Games.

A central finding is the role of regional blocs in shaping outcomes. Whether it was Asia and Africa aligning behind Beijing in 2008, Latin America rallying behind Rio de Janeiro in 2016, or European consensus supporting Paris in 2024, voting blocs reveal the influence of shared geopolitical and regional identities. This pattern demonstrates that IOC elections often serve as proxies for broader diplomatic contests, reflecting the balance of global political power at the time of bidding. The study also underscores the rising prominence of emerging economies and nations with strong geopolitical clout. China's successful Olympic bids exemplify the strategic use of economic power, diplomacy, and global influence, while Japan's Tokyo 2020 bid illustrates how advanced nations utilize their political stability, technological innovation, and cultural branding to gain international approval. These dynamics highlight that Olympic bids are part of a larger soft power competition, where hosting the Games becomes a symbol of national identity and global status. At the same time, the prevalence of backroom deals, reciprocal agreements, and opaque decision-making processes has raised concerns about transparency and accountability. The simultaneous awarding of the 2024 and 2028 Games to Paris and Los Angeles, though efficient in reducing political competition, also avoided the scrutiny of an open contest, reinforcing perceptions of behind-the-scenes bargaining. Such practices risk undermining the credibility of the IOC and eroding public trust in the Olympic Movement. Looking forward, meaningful reforms are necessary to safeguard the integrity of the bidding process. Initiatives such as Olympic Agenda 2020 have provided partial improvements, emphasizing sustainability and cost-efficiency, yet they have not fully addressed the pervasive political pressures embedded within IOC governance. To restore credibility, the IOC must adopt stricter transparency measures, enforce clear boundaries for lobbying, and ensure that technical assessments carry greater weight than political negotiations. In addition, empowering independent oversight mechanisms could reduce the disproportionate influence of powerful states and regional blocs. The politics of Olympic bidding reflects broader realities of international relations. The Games, envisioned as a symbol of global unity, paradoxically serve as an arena for political competition and geopolitical strategy. If the IOC is to uphold the Olympic ideals of fairness, neutrality, and global cooperation, it must critically reform its selection mechanisms to ensure that future host cities are chosen based on merit, capacity, and alignment with Olympic values rather than political influence. Only by addressing these systemic issues can the Olympic Movement preserve its legitimacy and continue to inspire the world through sport.

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Research Article

The effect of a proposed training curriculum using the plyometric method in developing the explosive strength of the arms and legs, and some grips of the ground fighting in Greco-Roman wrestling

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ABSTRACT

The researcher assumes: (1) There are significant differences in the proposed training curriculum using the plyometric method between the pre- and post-tests of the control and experimental groups, in favor of the post-tests of the experimental group. (2) The experimental group that uses plyometric exercises has the best effect on developing the explosive strength of the arms and legs, and some grips of the ground fighting in Greco-Roman wrestling. The researcher used the experimental method and designed two equal groups appropriate to the nature of the problem to be solved. The sample was chosen intentionally and consisted of 16 players from Adhamiya Greco-Roman wrestling Sports Club, ages 15–16 years. The control group included 5 players, and the experimental group also included 5 players, and 4 players who represented the pilot study. The researcher conducted physical and skill tests before, and a training curriculum was prepared using various plyometric exercises after consulting a group of experts to be appropriately applied to young wrestlers aged 15–16 years, whose primary purpose is to develop the explosive strength of the muscles of the upper limbs. Moreover, the lower limbs, and after completing the implementation of the training curriculum, the program (Statistical Package for the Social Sciences) was used to perform statistical treatments, and after presenting, analyzing, and discussing the results, the following conclusions were reached. (1) The differences were significant in the development of the explosive strength of the arms and legs using plyometric exercises for the experimental group in the physical tests. (2) The differences were significant in the development of strength in some grips of ground fighting in Greco-Roman wrestling using plyometric exercises for the experimental group in skill tests.

Keywords: Explosive strength, Greco-Roman wrestling, Plyometric exercises

INTRODUCTION

Introduction and Importance of the Research

Scientists and specialists in the foundations of sports training are still aspiring to find training methods that contribute to developing the capabilities of athletes and increasing their ability to perform specialized sports, improving physical and skill capabilities to suit the requirements of different sports, which leads to investing time and effort in reaching a high level of achievement. By crystallizing the training programs in their various stages in preparing the player physically, psychologically, skilfully, and tactically, and working on developing them to the maximum extent possible. The elements of physical fitness occupy the first major position in the preparation and design of training curricula, as they constitute major goals in preparation and preparation for the technical and tactical preparation of sports.

One of the first requirements of the wrestling sport curricula is to develop its physical characteristics in general and muscular strength in particular. The first concern is focused on the use of strength to develop muscular ability to reach the best performance, especially since the basic skills of the sport of wrestling, especially explosive strength, mainly contribute to determining the result, and the means and approaches to explosive strength training vary. Depending on the type of training system used, the necessary period, the training stage, the level of the players, and their capabilities. Each of these

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means and training methods has its purposes, objectives, and investment to develop the player's ability to perform well, as some of them depend on the intensity, volume, repetition, diversity, rest ratios, practice, and the required time period. For training, all of which are aimed at developing physical fitness and skill according to the requirements of the sport, while scientific sources indicate the use of plyometric exercises, which began to take a place in the field of sports training and participate in a large proportion in the development of explosive strength elements.

Wrestling is one of the sports that needs this type of training method to develop the explosive strength of the arms and legs, because of its great importance in resolving fights.

The technical grips in wrestling are among the basic skills in performance to obtain technical points and then achieve the goal of winning. Muscular strength is a decisive factor for many wrestling positions because it represents "the ability of the muscle to overcome or confront external resistance" (Al-Mandalawi, 1987, p. 85).

Ensuring the success of the performance of the grips in the wrestling requires an explosive strength that ensures overcoming the resistance of the opposing wrestler, as the grips have become extremely important by allowing the attacking wrestler to perform them repeatedly directly from the same position. If these grips are mastered, they need sufficient strength to overcome the wrestler's resistance the defender and to greater resistance, then the wrestler must resort to a method that exceeds the resistance of the colleague, and this method relies on training with weights or other devices and tools to develop explosive strength (Hoffman *et al*. 2008. p. 58).

This in turn will lead to the development of some physical characteristics of basic wrestling skills, and takes a new character in the complete link between physical and skill preparation to bring the players to a better level, and this was confirmed by (Abd Ali and Qasim Hassan 1988) "The most important characteristics that need to be implemented in preparing players are the development of basic physical characteristics and technical and tactical preparation." (Nassif and Hussain, 1988, p. 27).

The second importance in which this study participates is to draw the attention and interest of the trainers to introduce new exercises on which the training curricula rely in developing their physical characteristics for wrestling as an alternative to other traditional exercises.

Thus, it is considered an evaluation study of the work of the coaches and their training programs, in order to reach a sound planning situation to raise the level of our young players physically and skilfully, and to raise the level of the sport and expand its base in our beloved Iraq.

Statement of the Problem

Through the modest field experience of the researcher due to his practice of wrestling and his participation in fights at various levels, in addition to his work as a coach for many years, he is still working in this field. Note that one of the weaknesses of junior wrestlers that prevents them from improving their achievement is the presence of failures, with a large percentage, in the performance of some ground fighting.

The researcher attributes it to the existence of a weakness in the explosive strength of the muscle groups that work during the performance of these grips, so that the trainers focus on developing the maximum muscle strength, without focusing on the explosive strength of the same muscle groups involved in the performance. And since some grips of the ground fighting are characterized by the rotation of the defending wrestler to obtain technical points "Because wrestling requires rapid explosive strength during the execution of the fight within the requirements of the wrestling sport, which we find in plyometric exercises" (Forman Bill, 2009. p. 257).

This prompted the researcher to address the situation and prompted him to investigate the use of an alternative method through the implementation of plyometric exercises to develop the explosive strength of the working muscles of the arms and legs and in the light of the motor path of performance and a new method that was not previously used in their training and tended to balance and gradient between the intensity and repetitions required and appropriate for the sport of junior wrestlers Moreover, the use of plyometric exercises in developing the explosive strength of the arms and legs and its impact on some grips of ground fighting in Greco-Roman wrestling and measuring the effect of these exercises on the speed of performance through specialized tests for this purpose.

Research Objectives

The research aims to:

1. Preparing a proposed training curriculum using the plyometric method in developing the explosive strength of the arms and legs, and some grips of the ground fighting in Greco-Roman wrestling.
2. To identify the impact of a proposed training curriculum using the plyometric method in developing the explosive strength of the arms and legs, and some grips of the ground fighting in Greco-Roman wrestling.

Research Hypotheses

1. There are significant differences in the proposed training curriculum using the plyometric method between the pre- and post-tests of the control and experimental groups, in favor of the post-tests of the experimental group.

2. The experimental group that uses plyometric exercises has the best effect on developing the explosive strength of the arms and legs, and some grips of the ground fighting in Greco-Roman wrestling.

RESEARCH METHODOLOGY AND FIELD PROCEDURES

Methodology

The researcher used the experimental approach and designed the two equal groups that are appropriate to the nature of the problem to be solved, as "the experiment is an attempt to prove certain hypotheses, and the experimental research is the proof of the hypotheses through experiment" (Majoob 2001, p. 303).

Sample

The sample was chosen intentionally and consisted of 16 players from Adhamiya Greco-Roman wrestling Sports Club, ages 15–16 years. The control group included 5 players, and the experimental group also included 5 players, and 4 players who represented the pilot study.

The experimental variable represented by a group of explosive strength exercises in the plyometric style, which was prepared by the researcher according to the opinions of experts and specialists in the science of sports training and wrestling, was introduced to the experimental group, while the control group continued to practice the usual exercises related to the club trainer's approach. The researcher has homogenized the research sample in the variables that may have an impact on the results of the research, and these variables included height, mass, age, and training age, and using the torsion coefficient law as shown in Table 1.

Apparatus and Instruments

Various devices and tools have been used that have effectively contributed to reaching the areas of solving the research problem as a means of collecting data that is involved in the content of this study, namely:

Aids: Instruments

Tools and devices: Apparatus

A wrestling hall. A tape measure 10 m long. - A colored sticky tape with a width of 10 cm. - A chair with a belt to fix the trunk. A weight of 900 g, 9 height indicators 15, 30 cm, a box for collecting balls (box balls), a stopwatch, a weight measuring device, 8 boxes with heights of 20, 30, 35 cm, iron bar weight 5, 7) kg.

Table 1: The homogeneity of the research sample (age - height - mass - training age)

No.	Variables	Arithmetic mean	Median	Standard deviation	Torsion coefficient
1	Age	15.76	15.68	0.420	0.797
2	Height	1.63	1.62	0.044	−0.682
3	Mass	50.71	51.00	7.69	−0.154
4	Training age	3.47	3.58	0.85	−0.297

Tests Selection

The tests that scored more than 70% were selected, and the physical tests that scored <(70%) were excluded. Therefore, the following tests were adopted:

First: Explosive strength tests for the arms:
- Throwing a weight of 900 g at shoulder level
- Throwing a medicine ball weighing 2 kg from the sitting position on a chair.

Second: Explosive strength tests for the legs:
- Long jump from stability
- Sargent's vertical Jump.

Physical tests

A/Throwing a weight of 900 g from shoulder level (Allawi 1994, p. 114)
- An iron or steel weight weighing 900 g, noting that the size of the weight is small in the level of the size of a hockey ball or a soft ball
- Measuring tape
- Metal signs numbered from 1 to 3.

Procedures
- A flat area of space whose area is proportional to the age of the test subjects
- Determine an area to approach with two lines, the distance between them is 7.80 m
- The throwing area shall be marked with broad lines, the distance between each line being ¼ m.

Description of the performance
- The test subjects take a ready position inside the designated area for throwing, holding the weight in one of their hands
- When the test subjects give the starting signal, they move within the permissible distance, which is 1.8 m, to throw the weight in the direction of the throwing area
- Each test subject is given three consecutive attempts
- The test subjects should wait away from the throwing area until each tester finite his attempts.

Test management
- Recorder: He calls the test subjects, notes the performance, especially in the approaching area, and records the results
- Three observers: their task is to measure the distances and return the balls to the approach area after every three attempts.

Score calculation

- The degree of the test subjects is: the distance recorded in the best attempt calculated for the closest ¼ m from the weight landing area to the starting line, and when using the measuring tape, it must be noted that the tape is perpendicular to the starting line.

Testing the explosive strength of the legs

A/Standing broad jump (Hassanin, 1995, p. 400)

- Purpose: to measure the muscle strength of the muscles of the legs
- Tools: flat ground that does not expose the individual to slip, a measuring tape, and a starting line is drawn on the ground
- Performance specifications: The test subjects stands behind the starting line with the feet slightly apart and the arms high, the arms swing forward down behind with the knees bent in half. The torso leans forward until it reaches what looks like the starting position for swimming, from this position the arms swing forward strongly With the extension of the legs along the torso and pushing the ground with the feet forcefully in an attempt to jump forward as far as possible
- Recording: calculates the distance.

B/Sargent's vertical jump test (Allawi and Radwan; 1994, p. 84)

- Purpose of the test: Measuring the muscular strength of the legs in the vertical jump.

Tools needed

- A wooden board (blackboard) painted black, ½ m wide and 1½ m long. White lines are drawn on it, the distance between each line is 2 cm
- A smooth wall whose height is not <3.60 m from the ground
- A piece of chalk or gypsum powder, a piece of cloth to erase the gypsum marks after reading all the attempts made by the laboratory
- The board can be dispensed with by a piece of wood fixed to the wall.

Description of the performance

Test instructions

- The push should be done with the feet together from the stability position
- Before making the jump up, the test subject swings the arms forward and down to adjust the timing of the movement, to reach the maximum possible height
- The test subject is given three to five consecutive attempts, and the result of the best attempt is calculated
- Measurements are taken to the nearest 1 cm
- Jumping up is with the feet together from a stable position, not by taking a step or rising
- Do not extend the piece of chalk outside the fingers so that this does not affect the results
- It is preferable for the arbitrator to stand on a table or a ladder near the board so that he can clearly read the results of the different attempts.

Test management

- Recorder: Calls names and records results
- Observer: calculates grades and notes performance.

Score calculation

- The degree of the tester is the number of centimeters between the line he reaches from the standing position and the mark he goes as a result of jumping up, rounded to the nearest 1 cm.

Tests of the technical performance of grips (Mahmoud, 1997, p. 45)*

First grip: Gadring grip

Performance description: From the position of the ground fighting, the wrestler who is above the body of the defending wrestler enters his hands to encircle the torso with force from the waist area and rotate it to turn him into the dangerous position by leaning on his feet and curving on the head and continues until the completion of the rotation to return to the first position.

Second grip: Half Gadring grip

Performance description: From the ground fighting position (the wrestler who is on top of the body of the defending wrestler enters his hands to encircle the torso from the waist area, rotate and raise the defender to put his shoulders in a dangerous position facing the mat at an angle of <90° without completing his rotation and holding him in this position, then returning him in reverse direction of the previous position.

Third grip: Holding the waist throw

Description of the performance: From the position of the ground fighting, the attacking wrestler encircles the torso of the defending wrestler to raise him up and arch his body to throw him by turning sideways on his back.

Fourth grip: Single leg throw

Description of the performance: From the position of the ground fighting, the wrestler surrounds the attacking wrestler standing next to the defending wrestler and in the opposite direction with his arm close to the defender from the top of the waist area to the opposite side and with his far arm from the inside so that the arms hold together from the bottom and then puts his left foot under the body of the defender and bends his body and the defender is raised and curving high with it Then he raised it above his chest to drop it aside by rolling on his back.

Instructions for the technical performance tests of the four grips:

1. It is not allowed to shorten or modify the performance.
2. Each grip is performed once.
    - Method of registration: each grip is evaluated out of 10 points, which are evaluated by three specialists* and the evaluation score for each of them is collected and divided by 3.

Pilot Study

To identify the strengths and weaknesses of the tests used, the researcher conducted the Pilot study at 6:00 pm on Tuesday, July 06, 2022, on 4 wrestlers who were chosen from the same community of origin from outside the main sample of the experiment with the aim of achieving the following objectives:

1. Ensure the safety and security conditions of the used tests, tools, and devices
2. Ensure the location and suitability of the test
3. Ensure the validity of the test and the possibility of its implementation
4. Recognizing the efficiency of the assistant work team
5. Identify any negatives or obstacles that may surround the research
6. Identify the time taken for the tests.

Scientific Basis of the Tests

After defining the main objectives of the tests, the content, the quality of the paragraphs, and the preparation of special instructions for their implementation, the test must be standardized because it contributes to a good interpretation of the degree obtained by the test subject (Hasted and Lacy 1998. p. 264).

To ensure the validity of the tests, the researcher extracted the self-validity of the tests by treating the results of the reliability that he obtained from conducting the pilot study statistically to obtain the degree of validity of the tests by rooting the degree of reliability for each test, and the results were clear evidence that the coefficients of reliability and validity for all tests are high and for all weight classes of the sample. Validity of the scale means "that the scale is able to measure what it was designed to measure" (Rafeeq, 2022).

In order to ensure the objectivity of the tests, the researcher used neutral arbitrators when conducting the tests on the previously referred to sample, taking into account the stability of the conditions and the method in which the tests were conducted. The results of the sample for all the arbitrators in the second application, and the researcher obtained results that gave clear evidence of the objectivity of all the tests, as the coefficients of objectivity were very high, "as the test with good objectivity is the test that removes doubt and disapproval from the testers when applied" (Salamah 2001, p. 79.) Therefore, the researcher ensured the objectivity of the tests in measuring the variables for that those tests were designed.

Research Field Procedures

Skill and physical pre-tests

Before starting the physical and skill tests, the researcher organized the sample and divided it into two groups, as we mentioned, and then prepared the tools used to implement the physical and skill tests, and explained a general idea of implementation. The pre-tests were conducted for the control and experimental groups on Sunday and Monday, corresponding to July 17–18, 2022, in the wrestling hall of the Adhamiya Sports Club.

Plyometric Training Curriculum

A training curriculum was prepared using various plyometric exercises after consulting a group of experts in the field of sports training and wrestling *Those who added, with their observations and information, sufficient scientific immunity so that its application would be appropriate for youth wrestling at the ages of 15–16 years, whose main purpose is to develop the explosive strength of the muscles of the arms and legs, where the optimal method for training muscle capacity is the one in which the time course is similar strength with the working muscle groups during the exercise with the technical course of it through the skill itself" (Hossam El-Din, 1997, p. 82).

The application of the curriculum began on Sunday July 24, 2022, and continued until Sunday September 26, 2022. It was applied for 2 months/8 weeks/3 units per week (24) training units. The days in which the training dose for plyometric exercises was determined, after agreement with the experimental group, and the training days for the control and experimental groups were Sunday, Tuesday, and Thursday. Six o'clock set a time to start performing the curriculum after the warm-up process, which takes 10–15 min.

1. The plyometric exercises related to the wrestling sport were shown to sports training experts, as they were arranged according to their difficulty by gradient from horizontal jumping exercises to jumping through heights over figures and cones
2. The warm-up process is a basic priority for plyometric exercises, as attention must be given to stretching and jogging exercises with jogging and jumping, which are similar to the plyometric exercises used to give sufficient adaptation to the working muscles and joints, and the cool-down process must be included in every training module. brianmac (Demon 2009. p. 5)
3. The researcher worked on applying the exercises, especially since the sample was young people, and this type of plyometric exercise had not been used before
4. The duration of the exercises prepared in the curriculum was given within the regular training unit used in the

club, which lasted 120 min, and then the introduction of plyometric exercises within it, immediately after the warm-up, with a time of (35 min, for the experimental group, while the control group continued with the usual curriculum of the trainer

5. Feedback was given to each player, explaining the method of performing each exercise, to obtain correct results
6. 6- Work was done with great care to continue with the sample, applying it and performing the exercises throughout the allotted period.

With regard to the training load, it should be taken into account that the gradual increase in the degree of load, and this does not mean that the work increases from day to day, Rather, it means the stability of the level of load for a certain period from 1 week to 2 weeks, for example and then it increases gradually (Allawi, 2000, p. 96). From this concept, the researcher relied on a gradual path of intensity, "as the 1st weeks included exercises with a horizontal track using the feet together, such as jumps with alternating feet, to strengthen the hip and joints and to gain a necessary balance for the body." And throwing medical balls with light weights, according to the ability of the players, and in situations in which the degree of intensity is determined, such as performance first by throwing with both arms, then with one arm and so on.

As for the repetition (Frequency): it is the number of times to re-perform the exercise (repetitions), where the repetition is proportional to the intensity. The higher the intensity of the exercises performed the less repetition. And from this point of view, which the researcher relied on in setting the repetitions of plyometric exercises, where the gradient increased in the intensity of the exercises with a decrease in the times of re-performance of the exercise, and usually the number of repetitions in plyometric training is from 8 to 10 with the possibility of increasing these repetitions in low-intensity exercises and reducing them with high-intensity exercises, while the number of sets was between 3 and 6, especially high-intensity exercises. As a general rule, the number of repetitions and the number of sets vary according to the intensity of the exercises. High-intensity exercises require few repetitions, and low-intensity exercises require high repetitions. Moreover, the number of times a week to perform plyometric exercises was 3 days a week.

The rest period was determined according to the type of exercise performed, so that each of the plyometric exercises within the training unit is dedicated to a specific purpose. "The principle of privacy can also be applied in plyometric training exercises, as some exercises are designed to develop the strength of the step, and others are used to increase the ability to jump. And that application of the principle of privacy in plyometric exercises is decided by the goal required to be achieved, the nature of the movement, and its direction for the activity or the sports sport" (James 2004, p. 2423). Simple and horizontal exercises have been adopted to develop the work of the muscles of the two legs, such as horizontal jumps, on figures and boxes, whether forward or from the sides, when changing direction. As for the arms, two exercises have been developed. For the muscles of the arms on both sides, with weighted movements on both sides, and rapid twisting and rotation of the trunk muscles, with the basic assistance of the muscles of the arms and shoulders.

Post-tests

After completing the implementation of the training curriculum using plyometric exercises (explosive strength) on the experimental group, post-tests were conducted for the two groups control and experimental on Wednesday September 28, 2022, in the wrestling hall in the Adhamiya Sports Club. The tests were carried out under the same conditions and procedures as the pre-tests.

Statistical means

Statistical Package for the Social Sciences version (12) was used to perform statistical treatments.

PRESENTATION, ANALYSIS, AND DISCUSSION OF THE RESULTS

This chapter includes presenting, analyzing, and discussing the results, according to the data obtained, after completing the application of the training curriculum using plyometric exercises and converting them into tables.

Presentation of the Results of the (t) Test for the Variables of the Study and for the Control Group in the Pre- and Post-Tests

For the purpose of knowing the significant differences between the pre and post-tests in the tests (study variables) and for the control group, the researcher used the (*t*-test) for corresponding samples, as shown in Table 3.

Presenting The Results of the (T) Test for the Variables of the Study and for the Experimental Group in the Pre and Post-tests

Results Discussion

It has also been achieved to develop the level of performance through the production of higher strength in the shortest possible time, and this case is characterized by plyometric exercises characterized by high intensity and relatively small volume, which produces a link between strength and speed. "The method of plyometric exercises is the ideal method for developing the ability that is expressed by multiplying (strength X-speed)" (Plyometric. No1, Op. cit, 2001, p. 19). This is what the wrestler needs, which is to increase his speed during his attack on the opponent, where This moment is called the

Table 2: It shows the arithmetic mean, standard deviations, and the value of (T) calculated for the pre-test and for the control and experimental groups in the physical and skill tests

Variables	Measuring unit	Control		Experimental		(t) value	Significance
		Arithmetic mean	Standard	Arithmetic mean	Standard		
Legs explosive strength tests	Meter	1.11	0.19	1.18	0.17	1.13	Random
Arms explosive strength tests	Meter	6.87	1.37	6,65	1.54	1.09	Random
Gadring grip	Point	4.88	2.04	4.43	4.31	1.42	Random
Half Gadring grip	Point	4.74	3.45	4.29	4.27	1.68	Random
Holding the waist throw	Point	4.98	1.29	4.29	2.06	1.47	Random
Single leg throw	Point	3.14	1.21	3.00	2.38	1.80	Random

*Tabular *t*-value (2.88) at a degree of freedom (8) and a level of significance (0.05)

Table 3: It shows the arithmetic mean, standard deviations, and (*t*) value calculated for the pre- and post-tests and for the control group in the physical and skill tests

S. No.	Physical and skill tests	Measuring unit	Pre-test		Post-test		Total variances	Standard error	(*t*) value	Significance
			Arithmetic mean	Standard	Arithmetic mean	Standard				
1	Legs explosive strength tests	Meter	1.11	0.19	1.23	1.98	0.12	1.96	1.98	Random
2	Arms explosive strength tests	Meter	6.30	1.37	7.87	0.1.56	1.57	2.52	1.24	Random
3	Gadring grip	Point	4.50	1.17	5.80	1.44	1.30	0.20	1.76	Random
4	half Gadring grip	Point	5.66	1.90	6.00	1,89	0.44	2.59	1.90	Random
5	Holding the waist throw	Point	6.54	0.435	7.59	1,04	−2.028	0.437	1.43	Random
6	Single leg throw	Point	4.45	0.446	5.90	1.97	4,45	0.446	1.90	Random

*The tabular value of (*t*) is (2.47) under the level of significance (0.05) and with a degree of freedom (4)

Table 4: It shows the arithmetic mean, standard deviations, and the calculated (*t*) value for the pre- and post-tests and for the experimental group in the physical and skill tests

S. No.	Physical and skill tests	Measuring unit	Pre-test		Post-test		total variances	standard error	(*t*) Value	Significance
			Arithmetic mean	Std.	Arithmetic mean	Std.				
1	Legs explosive strength tests	Meter	1.95	0.98	2.80	0.77	0.85	2.99	3.98	Significant
2	Arms explosive strength tests	Meter	6.45	1.87	8.50	1.71	1.57	2.56	3.09	Significant
3	Gadring grip	Point	5.65	1.97	7.67	1.84	2.21	2.29	3.76	significant
4	half Gadring grip	Point	5.77	1.60	7.87	2.10	2.10	2.60	4.98	significant
5	Holding the waist throw	Point	6.66	1.45	7.99	1.04	2.33	2.54	4.87	significant
6	Single leg throw	Point	4.98	1.46	6.90	1.97	4.98	0.446	6.90	significant

*The tabular value of (*t*) is (2.47) under the level of significance (0.05) and with a degree of freedom (4)

moment of the fist, the strength of the hip's extension and flexion, the strength of the grip, the development of change in throwing the opponent to the ground, and the increase in reaction movements, lightness and flexibility, especially during the performance of the Holding the waist throw, as well as Single leg throw. Thus, it is clear that plyometric exercises for the legs and arms and their benefits in developing explosive strength has clearly appeared to be the main reason for developing this characteristic in the experimental group that used plyometric exercises, As for the group that used traditional exercises, the development was small, and this is what we noticed through the values of the arithmetic mean of the control group. "The

key to producing explosive strength comes from increasing the stretching loads on the working muscles, and they become more flexible toward the increasing loads, and thus the cycle of lengthening and shortening becomes more efficient, and the muscles will store more elastic energy and enable them to move quickly" (Talha Hosam El-Din, 1997, p. 301). Moreover, these cases are used in plyometric exercises more than in traditional exercises to increase loads, and (Talha Hussam El-Din, 1997) adds: "Plyometric exercises work positively to improve kinetic energy and elastic energy, which has a significant impact on the development of explosive strength through lengthening and shortening of muscle fibers. This also affects the rapid response of the muscles as a reflex reaction carried out by the spindles of the muscles" (Talha Hosam El-Din, 1997, p). "It is important for the player to maintain the vertical jump news because it works to develop explosive power, and from here the importance of plyometric training appears, as it affects the short time in which the feet touch the ground and the rapid contraction of working muscles" (PollockPhiladelphia, 2012, p69).

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

1. The differences were significant in the development of the explosive strength of the arms and legs using plyometric exercises for the experimental group in the physical tests
2. The differences were significant in the development of some grips in the ground fighting in Roman wrestling, using plyometric exercises for the experimental group in skill tests
3. The differences were random for the control group that did not undergo the training curriculum in the physical tests
4. The differences were random for the control group that was not subject to the training curriculum in skill tests
5. The choice of plyometric exercises to develop the explosive strength of the arms and legs was compatible with the working muscles of the wrestling skills in question, which caused an effective impact in developing their performance.

Recommendations

In light of the conclusions reached by the researcher, the following recommendations were made:

1. The need to emphasize the use of plyometric exercises to develop the explosive strength of the arms and legs to contribute to the development of the physical and skillful abilities of the junior wrestling players in different proportions
2. Choosing plyometric exercises so that they are similar to the skillful performance in terms of the motor path and the shedding of strength and working muscles for those skills of the wrestling sport in the ground fighting
3. Attempts to use plyometric exercises on other skills in the wrestling sport in ground fighting, which are appropriate to the level and capabilities of the players and according to their categories
4. Diversifying the use of plyometric exercises according to different repetitions and intensities.

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Research Article

Effect of 12 weeks of plyometric training and circuit training on speed and explosive power in intercollegiate male taekwondo athletes of osmania university

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ABSTRACT

The purpose of the present study was to determine the effect of plyometric training and circuit training on the selected performance parameters such as speed and explosive power of intercollegiate male Taekwondo players studying in affiliated colleges of Osmania University. To achieve the purpose of the study, the subjects were randomly selected from intercollegiate male Taekwondo players of Osmania University, Hyderabad, Telangana, India and their age group was 18–25 years. The selected subjects were divided into three groups of 15 each, namely two experimental groups and one control group. Out of total subjects of 45, 15 underwent plyometric training, another set of 15 underwent circuit training while the control group did not receive any specific training. The duration of the training period was 12 weeks at a rate of 3 sessions per week. The results of the study reveal that there is a significant improvement in plyometric training group and circuit training group when compared to control group. The improvement in performance may be attributed to plyometric and circuit training.

Keywords: Circuit training, Explosive power, Plyometric training, Speed

INTRODUCTION

Exercises in the plyometric program, a specialized high-intensity training method designed to improve motor abilities, include hurdles, horizontal and vertical jumps, drop jumps, and countermovement jumps. For football players to perform at their best, agility, a necessary motor skill and one of the physical requirements for success in many sports, is particularly crucial. The potential benefits of training methods that incorporate plyometric exercise are highlighted in a number of research.

Plyometric training is a quick, powerful movement involving a system of reactive exercises and an eccentric contraction, followed immediately by an explosive concentric contraction. Player accomplishes this through any movement utilizing the stretch-shortening cycle plyometric exercises help the player's muscles to respond with power and efficiency.

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The potential benefits of this training process include:

- Increased power output in the muscles
- Increased force in muscle contractions with less energy consumption
- Faster speed of muscle contractions or speed in general
- Improved ability to change directions quickly, which fitness professionals may refer to as agility or nimbleness
- Overall better control when stopping and starting movements
- Increased jumping height.

Circuit training is developed by the Scientist Morgan R.E. and Adamson G.T. at University of Leeds in the year 1957. This is Resistance to develop the motor abilities such as strength, Speed, and endurance. Circuit training is an exercise "circuit" which consists of prescribed exercises which includes the upper body, lower back, abdomen, and lower body. It can be done with own body weight and using the resistance exercises such as Barbells and Medicine Balls.

Circuit Training Benefits

- Helps develop power and muscle elasticity
- Improves stride frequency and length

- Develops co-ordination, encouraging the proper use of arm action during
- The Driving phase and feet in the support phase
- Develops control and stabilization as well as improved speed (downhill running)
- Promotes strength endurance
- Develops maximum speed and strength
- Improves lactate tolerance.

Kumar and Zemková (2022) studied the effect of 12-week core strengthening and weight training on muscle strength, endurance, and flexibility in school-aged athletes. Ninety male athletes at the age of 12 were randomly divided into three equal groups (30 in each). Group 1 underwent core strengthening training, group 2 underwent weight training, and group 3 was the control. The training was for 12 weeks, with three sessions per week (1 h/session). Before and after the training, abdominal strength, endurance, and flexibility were evaluated using the sit-ups test, the Cooper 12 min run test, and the sit and reach test. The analysis of variance was used to analyze pre- and post-intervention data. The results showed that both the core strength training group and the weight training group significantly (P = 0.00) improved in abdominal strength, represented by the number of sit-ups (from 18.70 ± 3.20 to 22.21 ± 3.50 and from 17.60 ± 3.29 to 21.60 ± 3.63, respectively); endurance, represented by distance covered in 12 min (from 1817 ± 185.78 m to 2008.97 ± 214.79 m and from 1806 ± 237.25 m to 2002.59 ± 83.32 m, respectively); and flexibility, represented by the sit and reach distance (from 23.48 ± 2.75 cm to 25.96 ± 2.38 cm and from 23.66 ± 2.92 cm to 25.86 ± 2.55 cm, respectively) when compared to the control group (from 17.20 ± 3.20 to 16.39 ± 2.69; from 1813 ± 224.69 m to 1778.15 ± 05.28 m; from 23.46 ± 3.06 cm to 21.76 ± 2.56 cm). More specifically, abdominal strength and endurance improved slightly more in the weight training group than in the core strength training group, while flexibility increased slightly more in the core strength training group than in the weight training group. These findings indicate that both core strengthening training and weight training are effective in improving physical fitness in school-aged athletes; however, the improvement is to differing extents regarding their endurance, flexibility, and abdominal strength.

METHODOLOGY

The purpose of the present study was to determine the effect of plyometric training and circuit training on the selected performance parameters such as speed and explosive power of intercollegiate male Taekwondo players studying in affiliated colleges of Osmania University. To achieve the purpose of the study, the subjects were randomly selected from intercollegiate male Taekwondo players of Osmania University, Hyderabad, Telangana, India and their age group was 18–25 years. The selected subjects were divided into three groups of 15 each,

Table 1: Computation of "*t*" ratio between pre-test and post-test means of experimental and control groups on speed among Taekwondo players

Groups↓	Pre-test for speed		Post-test for speed		"*t*"-test
	Mean	SD	Mean	SD	
Plyometric training	7.37	0.556	6.80	0.551	5.461*
Circuit training	7.77	0.679	7.30	0.535	4.474*
CG	7.63	0.556	7.60	0.563	1.000

*The table value is 2.045 with degree of freedom 44 at 0.05% level of significance. SD: Standard deviation, CG: Control group

Table 2: Computation of "*t*" ratio between pre-test and post-test means of experimental and control groups on explosive power among Taekwondo players

Groups↓	Pre-test for speed		Post-test for speed		"*t*"-Test
	Mean	SD	Mean	SD	
Plyometric training	2.07	0.201	2.15	0.167	2.964*
Circuit training	1.87	0.298	2.28	0.142	7.509*
CG	1.62	0.089	1.62	0.09	1.980

*The table value is 2.045 with degree of freedom 44 at 0.05% level of significance. SD: Standard deviation, CG: Control group

namely, two experimental groups and one control group. Out of total subjects of 45, 15 underwent plyometric training, another set of 15 underwent circuit training while the control group did not receive any specific training. The duration of the training period was 12 weeks at a rate of 3 sessions per week. The duration of the training period was 12 weeks at a rate of 3 sessions per week. The plyometric and circuit training groups were considered as independent variables whereas the performance parameters such as speed and explosive power were treated as dependent variables. Plyometric training exercises such as Burpees, Snow Board Hops, Broad Jumps, Half Squat Jumps, Lateral Jumps, and Explosive Step-Ups were given to the soccer players. The number of repetitions was 8 for 1–4 weeks, 9 for 5–8 weeks, and 10 for 9–12 weeks. For circuit training were given and the intensities were set as low, medium, and high for 1–4 weeks, 5–8 weeks, and 9–12 weeks, respectively, with the continuous method, repetition, and interval training method. The control group was not given any specific exercises.

CONCLUSION

The mean difference between the pre and post-test results of control and experimental groups was tested using "*t*" ratio to

determine the significance of the difference exhibited by the experimental and control groups during the training period of 12 weeks.

The significance of the difference between the pre and post-test mean values of speed of the plyometric training and circuit training group and control group was analyzed by *t*-test and found to be 5.461,4.474 and 1.000, respectively. Since the obtained '*t*'-test values of experimental groups are >tabular value of 2.045 with degree of freedom 44 at 0.05 level of significance, it may be inferred that the Circuit Training Group Plyometric Training Group showed significant improvement in the performance of speed. The control group not given any significant improvement.

The significance of the difference between the pre and post-test mean values of the standing broad jump of the plyometric training, circuit training group, and control group (CG) was analyzed by dependent '*t*'-test and found to be 2.964*, 7.509* and 1.980, respectively. Since the obtained '*t*'-test values of experimental groups are >tabular value of 2.045 with degree of freedom 44 at 0.05 level of significance, it may be inferred that the Plyometric Training and Circuit Training Group showed significant improvement in the performance of the standing broad jump. However, the control group did not show an insignificant difference.

RECOMMENDATIONS

The results of the study reveal that there is a significant improvement in the plyometric training group and circuit training group when compared to control group. The improvement in performance may be attributed to plyometric training and circuit training.

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Research Article

Comparison of speed among Kabaddi and Kho-Kho women players of government college of physical education, Hyderabad

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ABSTRACT

The purpose of the study was to compare the speed among Kabaddi and Kho-Kho women players of government college of physical education. 100 female Kabaddi and Kho-Kho players studying in government college of physical education between the ages of 18 and 25 were chosen as samples for the study. The study's design was based on a straight forward random sampling. N-100 female players of Kabaddi and Kho-Kho from government college of physical education between the age group 18 and 25 were provided as samples for the study. The participants were split into two groups. The data were collected and compared from 50 Kabaddi and 50 Kho-Kho women players of government college of physical education. 50 M run test was used to determine the speed. Based on mean values, Kho-Kho players were performing better than Kabaddi players.

Keywords: Kabaddi, Kho-Kho, Speed, etc.

INTRODUCTION

Kabaddi is a contact team sport played between two teams of seven players. The objective of the game is for a single player on offense, referred to as a "raider," to run into the opposing team's half of the court, touch out as many of their players and return to their own half of the court, all without being tackled by the defenders in 30 s. Points are scored for each player tagged by the raider, while the opposing team earns a point for stopping the raider. Players are taken out of the game if they are touched or tackled but are brought back in for each point scored by their team from a tag or a tackle.

Kho-Kho is a traditional game played in India. Its origins are ancient, with strategies and tactics likely derived from the epic "Mahabharata" and on the 13th day of the war, the Kaurava General Guru Dronacharya created the "Chakravyuha." The Kho-Kho player's performance depends on optimum state of motor factors such as speed, endurance, agility, and flexibility, and speed and agility are the key characteristics which are the most important factors for good performance.

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Luxmi and Suniti (2024) the purpose of the study is comparing the study of physical variables of speed, flexibility, and agility among Kho-Kho and Kabaddi players of Delhi. For the purpose of this study, players of age group 16–18 years have been considered. A total sample size of 150 players will be taken for the study. 75 players each of Kho-Kho and Kabaddi are considered for the sample size. The study has been carried out on the players of Delhi state. The components of physical fitness were selected for the present study and were measured by 50 yard dash, sit and reach test, shuttle run. Our analysis shows that the Kho-Kho player has better speed, flexibility, and agility than the Kabaddi players. It has been found that the mean values of the speed. Flexibility and agility for the Kho-Kho player are higher by almost 10% than the Kabaddi players.

METHODOLOGY

The purpose of the study is to compare the speed among Kabaddi and Kho-Kho women players of Government College of Physical Education. 100 female Kabaddi and Kho-Kho players studying in Government College of Physical Education

Table 1: The mean values in speed among Kabaddi and Kho-Kho women players of government college of physical education

Group	Number of subjects	Mean	Standard deviation	Standard error
Kabaddi	50	6.870	0.793	0.112
Kho-Kho	50	6.231	0.915	0.129
Total	100	6.550	0.911	0.091
	Sum of squares	**df**	**Mean square**	**F-value**
Among groups	10.202	1	10.202	13.886
between groups	71.998	98	0.735	
Total	82.199	99		

between the ages of 18 and 25 were chosen as samples for the study. The study's design was based on a straight forward random sampling. N-100 female players of Kabaddi and Kho-Kho of Government College of Physical Education between the age group 18 and 25 were provided as samples for the study. The participants were split into two groups. The data were collected and compared from 50 Kabaddi and 50 Kho-Kho women players of Government College of Physical Education. 50 M run test was used to determine the speed.

RESULTS AND DISCUSSION

There is no significantly mean speed (50 M dash [s]) difference among Kabaddi and Kho-Kho women players of Government College of Physical Education. The mean speed (50 M dash [s]) difference is significantly different in among Kabaddi and Kho-Kho women players in north Telangana region.

Table 1 reveals that the average speed of 50 Kabaddi players (30 M dash [s]) is 6.870 and standard deviation is 0.793; similarly, the average speed of 50 Kho-Kho players (30 M dash [s]) is 6.231 and standard deviation is 0.915 which is extracted. Table 1 describes that with (1,98)° of freedom and a determined F-value of 13.886, $P = 0.0000.05$ significance level, the table value is 3.94 at a 5% level of significance. Given that the estimated F-value is greater than the table value, the null hypothesis was rejected, and it was determined that women who play Kabaddi and Kho-Kho in north Telangana had significantly different average speeds. Based on mean values, Kho-Kho players were performing better than Kabaddi players.

RESULTS

Based on mean values, Kho-Kho players were performing better than Kabaddi players. The Kho-Kho players are excellent in running speed, agility, and stamina to excel. Players must run quickly and efficiently to tag opponents and use quick movements to dodge attempts to be tagged.

CONCLUSION

It is concluded that Kho-Kho female players have better speed compared to female Kabaddi players. This type of study is useful for the coaches for better coaching.

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Research Article

Examining participant satisfaction at Ho Chi Minh Hockey Festival

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ABSTRACT

Ho Chi Minh City Hockey Festival is a pioneering international grassroots sport event in Vietnam, yet little is known about participant experiences in this context. This study applied the SERVQUAL model and customer satisfaction index to assess satisfaction among 162 athletes at the 2022 Festival. Six dimensions were evaluated: facilities, reliability, responsiveness, service competence, empathy, and satisfaction. Results showed that reliability was rated highest ($M = 4.2 \pm 0.25$), while responsiveness was lowest ($M = 3.2 \pm 0.54$). The findings highlight the importance of fairness, transparency, and empathy in enhancing satisfaction, while underscoring the need for improved responsiveness and supporting facilities. The study contributes empirical evidence to sport event management in developing countries and offers practical guidance for improving future events in Vietnam.

Keywords: Customer satisfaction index, Ho Chi Minh City Hockey Festival, Participant satisfaction, SERVQUAL, Sport events

INTRODUCTION

Hockey is one of the oldest sports, with evidence of similar games dating back approximately 4,000 years in Egypt, Persia, and Ethiopia.[1] In Europe, various primitive forms of hockey were widespread, such as hurling in Ireland and Shinty in Scotland. The term hockie was first recorded in Ireland in 1527, and it has been suggested that the word derived from the French term hoquet, meaning "shepherd's crook".[2] The modern form of hockey emerged in England in the nineteenth century, with Blackheath, traces of hockey played as early as the 1840s and formally recognized in 1861 which recognized as one of the world's oldest hockey clubs.[3]

Among its variations, field hockey is the most widely played. It is a team sport contested by two sides of eleven players (ten field players and one goalkeeper). The goalkeeper is the only player permitted to touch the ball with the body, while field players may use only the flat side of the stick to control play. Field hockey made its Olympic debut in 1908, reappeared in 1920, and has been a regular medal sport since 1928.[2] Today, the sport is strongly developed in countries such as Australia, Argentina, Belgium, the Netherlands, India, Malaysia, New Zealand, and Singapore (IOC, n.d.). Beyond its competitive nature, field hockey provides significant benefits for physical fitness, teamwork, and community cohesion.[4] At the governance level, the International Hockey Federation oversees and promotes the sport through five continental federations and more than 130 national associations, including Vietnam.[1]

Although field hockey has a long history and wide global presence, the sport remains relatively new in Vietnam, and few scientific studies have examined the development of hockey participation or event organization in this context. International research on sport event management has largely focused on mega-events such as the Olympic Games, the FIFA World Cup, or professional leagues.[5] In contrast, community-based and small to medium-scale international exchange events hosted in developing countries, such as Ho Chi Minh City Hockey Festival which have received limited scholarly attention. This gap is significant, as such events play a critical role in promoting the destination image, fostering a sporting community, and encouraging wider participation in physical activities.

Ho Chi Minh City Hockey Festival represents a prominent international exchange event for the development of hockey

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in Vietnam. In 2022, the tournament was hosted at Ho Chi Minh City University of Sport, featuring four competition categories: Men's, women's, mixed-gender, and men over 45. The event brought together 29 clubs and nearly 200 athletes, including more than 100 international participants from countries such as Singapore, Thailand, Malaysia, India, the United Arab Emirates, as well as athletes from Europe, Australia, and Africa. It marked the first international hockey event in Vietnam since the COVID-19 pandemic. The results saw Bangkok International Hockey Club (Thailand) win the mixed-gender category, Tornadoes Hockey Club (Singapore) secure the women's title, and Ultimate Hockey Club (Malaysia) claim the men's championship.[6]

In the post-COVID-19 context, although research has examined the global impacts of the pandemic on the sports industry and the changing behaviors of both spectators and athletes,[7] no study has yet analyzed participant experiences and satisfaction at an international grassroots sport event in Vietnam after the pandemic. These gaps highlight the need for the current study, "Evaluating Participant Satisfaction at Ho Chi Minh City Hockey Festival," which aims not only to contribute scientific evidence to the sport event management literature but also to provide practical insights for enhancing the organization of international sport events in Vietnam.

METHODS

Grounded in satisfaction theory, this study integrated the SERVQUAL model of service quality with the customer satisfaction index (CSI) framework. A pilot study was conducted with 100 students from Ho Chi Minh City University of Sport. Cronbach's alpha and exploratory factor analysis were employed to eliminate items deemed unsuitable for the research context. Based on the pilot results, the final measurement scale was developed comprising six dimensions: (1) Facilities (9 items), (2) Reliability (7 items), (3) Responsiveness (4 items), (4) Service competence (4 items), (5) Empathy (3 items), and (6) Participant satisfaction (3 items).

RESULTS

Demographic Characteristics of Participants

Of the 162 athletes participated in Ho Chi Minh City Hockey Festival, 103 were male (63.6%) and 59 were female (36.4%). In terms of age distribution, the largest group was 18–29 years old (70 participants, 43.2%), whereas the smallest group comprised those over 60 years old (16 participants, 8.6%). Regarding marital status, 86 participants (53.1%) were married and 76 (46.9%) were single.

With respect to education, university graduates constituted the largest group (63 participants, 38.9%), followed by those with postgraduate qualifications (39 participants, 24.1%). Other qualifications were reported by 30 participants (15.8%), vocational or college education by 25 participants (15.4%), and only five respondents (3.1%) had completed high school as their highest level. In terms of occupation, athletes represented the largest category (45 participants, 27.8%), followed by students (41, 25.3%), office workers (22, 13.6%), and government employees (21, 13.0%). Coaches accounted for 15 respondents (9.2%), while smaller groups included those engaged in business or trade (8, 4.9%), other occupations (6, 3.7%), and retirees (4, 2.5%).

Monthly income levels also varied: the largest group reported earnings above 15 million Vietnamese dong (55 participants, 33.9%), whereas the smallest group indicated no income (11 participants, 6.8%). In terms of nationality, participants came from a range of countries. Vietnam accounted for the largest share (66 participants, 40.7%), while India represented the smallest group (8 participants, 4.9%).

Training and Competition Participation

In terms of training experience, the largest group of participants reported 5–10 years of practice (60 participants, 37.1%), followed by those with 2–5 years (45 participants, 27.8%). A smaller proportion had <2 years of training (28 participants, 23.7%), while 29 respondents (17.8%) had more than 10 years of experience. With regard to participation in Ho Chi Minh City Hockey Festival at the international level, the majority had competed 3–4 times (82 participants, 50.6%). This was followed by those with five or more participations (39 participants, 24.1%) and those with 1 - 2 participations (29 participants, 17.9%). Only 12 respondents (7.4%) were 1st-time participants.

A similar pattern emerged for Hockey Festivals held in Vietnam. Over half of the respondents (53.8%) reported 3–4 participations, while 26.4% had attended 1–2 times. First-time participants accounted for 10.0%, and the smallest group comprised those who had participated 5 or more times (9.8%).

Participant Satisfaction with Ho Chi Minh City Hockey Festival 2022

Based on the survey results, participant satisfaction was analyzed by calculating the mean value for each dimension. Results indicate that the highest-rated dimension was Reliability ($M = 4.2 \pm 0.25$), followed by Overall satisfaction ($M = 3.9 \pm 0.51$), Empathy ($M = 3.7 \pm 0.64$), Facilities ($M = 3.6 \pm 0.28$), and Service competence ($M = 3.5 \pm 0.16$). The lowest-rated dimension was Responsiveness ($M = 3.2 \pm 0.54$), reflecting a relatively low level of satisfaction in this area.

Facilities: Within this dimension, item FAC1: *"The seating arrangement for athletes during competition was appropriately*

Table 1: Mean and standard deviation of satisfaction factors

Dimension	Code	Mean	SD	Rank
Reliability	REL	4.2	0.25	1
Satisfaction	SAT	3.9	0.51	2
Empathy	EMP	3.7	0.64	3
Facilities	FAC	3.6	0.28	4
Service competence	SER	3.5	0.16	5
Responsiveness	RES	3.2	0.54	6

SD: Standard deviation

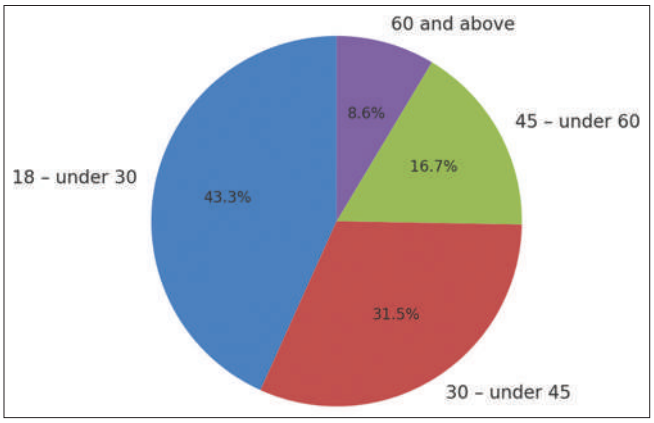

Figure 1: Age group of participants

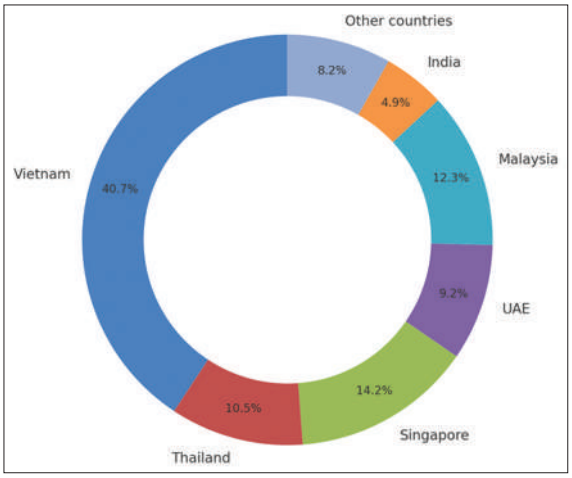

Figure 2: Nationality of participants

organized" received the highest evaluation (M = 4.4 ± 0.35). In contrast, item FAC9: *"The resting and waiting area for athletes was spacious and comfortable"* obtained the lowest score (M = 2.8 ± 0.16).

Reliability: All items in this dimension were rated at the level of "satisfied or above." The highest-rated item was REL4: *"The organizing committee applied the rules correctly"* (M = 4.5 ± 0.47).

Responsiveness: Within this dimension, item RES1: *"The organizing committee always provided timely notifications to athletes regarding schedule changes"* received the highest score (M = 4.0 ± 0.44). In contrast, item RES4: *"The organizing committee was ready to assist you in any situation"* obtained the lowest mean score (M = 2.6 ± 0.34).

Service competence: The highest-rated items were SER2: *"The service manner of the organizing committee and referees inspired confidence"* and SER3: *"The organizing committee and referees handled incidents fairly"* (both M = 3.8). These were followed by SER4: *"The organizing committee and referees were courteous and polite in handling issues"* (M = 3.7 ± 0.29). The lowest score was for SER1: *"The organizing committee and referees possessed sufficient knowledge to answer your questions"* (M = 2.7 ± 0.42).

Empathy: Results showed that all items reached the level of "satisfied or above." The highest-rated item was EMP3: *"The organizing committee understood your special needs"* (M = 4.1 ± 0.47). The lowest-rated item was EMP2: *"The organizing committee always listened to and respected the opinions of participants"* (M = 3.2 ± 0.62).

Satisfaction: All items in this dimension were rated "satisfied or above." The highest-rated item was SAT1: *"You will participate in Ho Chi Minh City Hockey Festival 2023"* (M = 4.0 ± 0.59). The lowest score was SAT2: *"You will recommend others to participate in Ho Chi Minh City Hockey Festival 2023"* (M = 3.6 ± 0.34).

DISCUSSION AND CONCLUSION

The survey of 162 participants at Ho Chi Minh City Hockey Festival 2022, held at Ho Chi Minh City University of Sport, indicated that overall satisfaction was at a moderate-to-high level. Among the six dimensions, Reliability received the highest rating (M = 4.2 ± 0.25), followed by Satisfaction (M = 3.9 ± 0.51) and Empathy (M = 3.7 ± 0.64). Facilities (M = 3.6 ± 0.28) and Service competence (M = 3.5 ± 0.16) were assessed at an average level, while Responsiveness recorded the lowest score (M = 3.2 ± 0.54), reflecting limitations in the organizing committee's capacity to provide timely assistance and feedback.

The findings provide a clear picture of participant satisfaction with Ho Chi Minh City Hockey Festival 2022. Overall satisfaction was rated as fairly high, with Reliability standing out (M = 4.2 ± 0.25). This suggests that athletes trusted the transparency and fairness of event operations, particularly the correct application of competition rules (REL4, M = 4.5 ± 0.47). Fairness and transparency remain fundamental for maintaining healthy competition and

strengthening participants' trust. However, the results also highlighted notable shortcomings. Responsiveness was the lowest-rated dimension (M = 3.2 ± 0.54), especially RES4: *"The organizing committee was ready to assist you in any situation"* (M = 2.6 ± 0.34). This reflects insufficient flexibility in supporting athletes and indicates weaknesses in communication and feedback mechanisms. In the SERVQUAL model, responsiveness is one of the core determinants of satisfaction; thus, low performance in this dimension may directly influence participants' intention to recommend the event (SAT2, M = 3.6 ± 0.34), even though the intention to return remained relatively strong (SAT1, M = 4.0 ± 0.59). In addition, Facilities (M = 3.6 ± 0.28) did not fully meet expectations, particularly item FAC9: *"The resting and waiting area for athletes was spacious and comfortable"* (M = 2.8 ± 0.16). This issue is common at grassroots sport events, where supporting spaces for athletes are often underdeveloped. Furthermore, Service competence (M = 3.5 ± 0.16) also revealed certain weaknesses, especially item SER1: *"The organizing committee and referees possessed sufficient knowledge to answer your questions"* (M = 2.7 ± 0.42). This indicates that the limitation lies not in service attitude (as SER2 and SER3 received relatively high ratings), but primarily in technical knowledge and the ability to handle situations effectively. A positive aspect was found in the Empathy dimension (M = 3.7 ± 0.64), where EMP3: *"The organizing committee understood your special needs"* received a mean score of 4.1 ± 0.47. This indicates that the organizing committee demonstrated a certain level of consideration for individual needs, contributing to participants' sense of being respected. Within the CSI framework, this factor plays an important role in sustaining overall satisfaction and encouraging intentions to return. When compared with international studies, the findings of this research show notable similarities. For instance, Duan and Liu (2021), in their study of audience satisfaction at a marathon in China, confirmed that satisfaction serves as a critical mediating factor influencing revisit and recommendation behaviors. The present study reflects a similar pattern: Although athletes expressed relatively strong intentions to return (SAT1), their willingness to recommend the event to others (SAT2) remained limited, suggesting the need to improve the quality of experience to transform satisfaction into positive word-of-mouth behavior.[8] Furthermore, Gokce and Bozyigit (2020), in their investigation of a sports festival in Turkey, reported that satisfaction varied according to demographic factors such as gender, education, and occupation. Since these demographic variables (gender, age, education level, and occupation) were also collected in the current study, extending the analysis to group comparisons could yield deeper insights and support the organizing committee in developing tailored strategies for different participant segments.[9]

Overall, this study not only reaffirms the value of customer satisfaction measurement theories such as SERVQUAL and CSI but also adds empirical evidence within the context of grassroots sport events in Vietnam. These findings are significant not only for event management at Ho Chi Minh City University of Sport but also for enriching the broader body of international research on satisfaction in sport tourism and sport events.

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Research Article

Effect of yoga posture and breathing exercises on body mass index for university college students

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ABSTRACT

The purpose of the study was to investigate the Effect of yoga Session on body mass index (BMI) for University College Students. The subject was 30 University College Students. The age of the subject ranged from 20 to 22 years. Before started yoga Session BMI was measured with help of digital height and weight machine for measuring BMI. After 8 weeks measured standing posture, sitting posture and lying posture and breathing exercise, again same measurement was taken. The data were analyzed by applying paired t-test and descriptive statistical technique and product movement correlation was employed to observed the mean (M), standard deviation and other parameters. The analysis of data was worked out by using the IBM – Statistical Package for the Social Sciences version 20. The level of significant was set at 0.05. The findings of the present study have indicated that Yoga Posture and Breathing practices gave significant reduction on BMI for University College Students.

Keywords: Body mass index, Breathing exercise, Yoga posture

INTRODUCTION

A 5000 year old tradition, yoga, is now regarded in the Western world as a holistic approach to health and is classified by the National Institutes of Health as a form of Complementary and Alternative Medicine (CAM) (Williams *et al*., 2003). The word "yoga" comes from a Sanskrit root "yuj" which means union, or yoke, to join, and to direct and concentrate one's attention (Lasater and Raub, 2002). Regular practice of yoga promotes strength, endurance, flexibility and facilitates characteristics of friendliness, compassion, and greater self-control, while cultivating a sense of calmness and well-being (Collins and Mc Call). Sustained practice also leads to important outcomes such as changes in life perspective, self-awareness and an improved sense of energy to live life fully and with genuine enjoyment (Desikachar and Atkinson). The practice of yoga produces a physiological state opposite to that of the flight-or-fight stress response and with that interruption in the stress response, a sense of balance and union between the mind and body can be achieved (Arora and Bhattacharjee, 2008).

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Yoga is a form of mind-body fitness that involves a combination of muscular activity and an internally directed mindful focus on awareness of the self, the breath, and energy (Collins, 1998). Four basic principles underlie the teachings and practices of yoga's healing system (Desikachar, 2005). The first principle is the human body is a holistic entity comprised of various interrelated dimensions inseparable from one another and the health or illness of any one dimension affects the other dimensions. The second principle is individuals and their needs are unique and therefore must be approached in a way that acknowledges this individuality and their practice must be tailored accordingly. The third principle is yoga is self-empowering; the student is his or her own healer. Yoga engages the student in the healing process; by playing an active role in their journey toward health, the healing comes from within, instead of from an outside source and a greater sense of autonomy is achieved. The fourth principle is that the quality and state of an individual's mind is crucial to healing. When the individual has a positive mind-state healing happens more quickly, whereas if the mind-state is negative, healing may be prolonged.

Yoga philosophy and practice were first described by Patanjali in the classic text, *Yoga Sutras*, which is widely acknowledged as the authoritative text on yoga (Lasater and Desikachar). Today, many people identify yoga only with asana, the physical

practice of yoga, but asana is just one of the many tools used for healing the individual; only three of the 196 sutras mention asana and the remainder of the text discusses the other components of yoga including conscious breathing, meditation, lifestyle and diet changes, visualization and the use of sound, among many others. In *Yoga Sutras*, Patanjali outlines an eightfold path to awareness and enlightenment called *ashtanga*, which literally means "eight limbs" (Maehle, 2006).

The eight limbs are comprised ethical principles for living a meaningful and purposeful life; serving as a prescription for moral and ethical conduct and self-discipline, they direct attention towards one's health while acknowledging the spiritual aspects of one's nature. Any of the eight limbs may be used separately, but within yoga philosophy the physical postures and breathing exercises prepare the mind and body for meditation and spiritual development. Based on Patanjali's eight limbs, many different yogic disciplines have been developed. Each has its own technique for preventing and treating disease. In the Western world, the most common aspects of yoga practiced are the physical postures and breathing practices of Hatha yoga and meditation (Collins, 1998). Hatha yoga enhances the capacity of the physical body through the use of a series of body postures, movements (asanas), and breathing techniques (pranayama). The breathing techniques of Hatha yoga focus on conscious prolongation of inhalation, breathe retention, and exhalation. It is through the unification of the physical body, breath, and concentration, while performing the postures and movements that blockages in the energy channels of the body are cleared and the body energy system becomes more balanced. Although numerous styles of Hatha yoga exist, the majority of studies included in this manuscript utilized the Iyengar style of yoga. The Iyengar method of Hatha yoga is based on the teachings of the yoga master B.K.S. Iyengar yoga places an emphasis on standing poses to develop strength, stability, stamina, concentration and body alignment. Props are utilized to facilitate learning and to adjust poses and instruction is given on how to use yoga to ease various ailments and stressors.

Yoga is recognized as a form of mind-body medicine that integrates an individual's physical, mental and spiritual components to improve aspects of health, particularly stress related illnesses (Atkinson, 2009). Evidence shows that stress contributes to the etiology of heart disease, cancer, and stroke as well as other chronic conditions and diseases (Granath, 2006). Due to the fact that stress is implicated in numerous diseases, it is a priority to include a focus on stress management and reduction of negative emotional states in order to reduce the burden of disease. Viewed as a holistic stress management technique, yoga is a form of CAM that produces a Physiological sequence of events in the body reducing the stress response. The scientific study of yoga has increased substantially in recent years and many clinical trials have been designed to assess its therapeutic effects and benefits.

As participation rates in mind-body fitness programs such as yoga continue to increase, it is important for health care professionals to be informed about the nature of yoga and the evidence of its many therapeutic effects. Thus, this review of the literature is timely and important and provides information regarding the therapeutic effects of yoga in various populations concerning a multitude of different ailments and conditions. Therapeutic yoga is defined as the application of yoga postures and practice to the treatment of health conditions. Yoga therapy involves instruction in yogic practices and teachings to prevent reduce or alleviate structural, physiological, emotional and spiritual pain, suffering or limitations. Yogic practices enhance muscular strength and body flexibility, promote and improve respiratory and cardiovascular function, promote recovery from and treatment of addiction, reduce stress, anxiety, depression, and chronic pain, improve sleep patterns, and enhance overall well-being and quality of life (Kissen, 2009).

RESEARCH METHOD

The purpose of the study was to investigate the effect of Yoga Posture and Breathing Exercises on body mass index (BMI) for University College Students. The subject wase 30 University College Students. The age of the subject ranged from 20 to 22 years. The subjects were selected randomly from University College Students. Before started yoga session and breathing exercises BMI was measured with help of digital height and weight machine for measuring BMI. After 8 weeks yoga posture and breathing exercises, standing posture, sitting posture and lying posture and breathing exercise. Again same measurement was taken. The data were analyzed by applying paired t-test and descriptive statistical technique and product movement correlation was employed to observed the mean (M), standard deviation (SD) and other parameters. The analysis of data was worked out using the IBM – Statistical Package for the Social Sciences version 20. The level of significant was set at 0.05.

RESULTS AND FINDINGS

Table 1 shows that BMI of University College Students. The pre-test mean and SD 21.09 and 1.55. The post-test mean and SD of 18.2 and 1.72. The obtained t test value is 2.83 which is greater than table value of 1.98 with df 29. The results of study significantly altered the BMI of University College Students. Due to effect of Yoga Posture and Breathing Exercises.

DISCUSSION ON FINDINGS

Based on the result, yogic practices on BMI show significantly reduction of University College Students. The results line with that effect of yogic therapy BMI was significantly reduced of obese male students (Suchetha Kumari *et al*., 2011).

Table 1: The computation of' test of body mass index of university college students

Test	Mean	Standard deviation	D.M	DM	"t"
Pre-test	21.095	1.55	2.89	1.02	2.83*
Post-test	18.200	1.72			

*Significant
Level of significant was fixed at 0.05 with degrees of freedom 29–1.98

Figure 1: The bar diagram showing mean values of body mass index of university college studentsq

The researcher conducted a study on 8 week physical endurance and diet-restriction program significantly decreases the BMI in 24 obese adolescent boys. **(**Benounis *et al*., 2008). Similarly, Wong *et al*. (2008) stated that exercise training significantly changes the BMI found out 3 months of yogic exercise such as Asanas and Pranayama (breathing exercises) significantly change the BMI (Ramesh and Subramaniam, 2011).

CONCLUSION

Based on statistically proven the following conclusions are drawn.

Effect of Yoga Posture and Breathing Exercises Significantly reduced their BMI of university college students.

IMPLICATIONS AND SIGNIFICANCE

Worldwide pupils are getting any type of disease. Those who are practice yoga posture and breathing exercises the persons get relief from their disease.

From child to Senior citizen also practice Yoga posture and breathing exercise according to their capacity levels.

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Research Article

A comparative study on emotional intelligence of height-weight-matched early teen school students of rural and urban area

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ABSTRACT

Emotions enable us to experience life. Emotional intelligence (EI) is an intellectual capacity to achieve a person's goal. The present study was taken up to observe the difference, if any, on EI of early teen boys school students of 13-year, 14-year, and 15-year age group. The students were from the rural and urban areas of different districts of West Bengal. Subjects of the study were four hundred fifty-six of three age group categories and a similar number of age and height-weight-matched student. As a measure of EI, the Bengali version of EI Inventory by Mangal, S.K. and Mangal, S. was used mean, standard deviation, and analysis of variance, followed by *post hoc* LSD and independent t-test. The statistics were used for data interpretation. Significant difference ($P < 0.05$) was observed among the 13-year, 14-year, and 15-year age groups. In rural and urban area, the significant difference was observed.

Keywords: Emotional intelligence, Rural, Student, Urban

INTRODUCTION

The popularization of emotional intelligence (EI) has been a major event in the history of the psychological construct. The merging of emotion and intelligence as a cognitive ability under the caption of EI was proposed by Yale psychologists, Salovey and Mayer (1990). Mayer and Salovy (1997) defined EI as the ability to perceive emotions, integrate emotions to facilitate thoughts, understand emotions, and regulate emotions to promote personal growth. According to Singh (2006) EI is the ability of an individual to appropriately and successfully respond to a vast variety of emotional stimuli being elicited from the inner self and immediate environment. Goleman (1995) reported some emotional reactions and emotional memories can be formed without any conscious, cognitive participation at all.

Dhankar (2025) stated that EI is essential for the development of students' academic performance, interpersonal relationships, and mental well-being in the context of higher secondary education, where they experience rapid cognitive, emotional, and social transformations. Urban and rural students frequently encounter distinct sociocultural environments, educational facilities, parental approaches, and resource availability, all of which can influence their emotional development. Professional guidance, technologically enhanced education systems, and increased exposure to extracurricular activities may be advantageous for urban students, as they may promote EI. However, rural students may be raised in communities that are more tightly connected, with a greater emphasis on social cohesion and familial ties, which can also facilitate emotional development, albeit in distinct ways.

Shapiro (2000) stated that EI starts to develop at birth. The first emotional attachment of the child appears when the mother provides for his/her needs. The quality of increasing interaction of the child with others in his/her intimate environment, such as parents, siblings, friends, and teachers, may develop or weaken his/her EI.

Smith and Walden (1999), in a study about preschool children, determined that children subjected to negative attitudes show more negative emotions, and their understanding of emotions and coping strategies is weak. Children's effective use of

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emotions enables them to control their instinctive reactions in stressful conditions, to learn to better communicate their emotional state, to develop healthy relationships with family and friends, and to become successful in school, work, and life.

Sharma (2011) found EI impacts adaptability. Students with high EI have a high degree of adaptability, due to which they are well adapted in their environment enabling them to perform well in their academic subjects.

We are at the beginning of a new century, and nowadays, EI is considered more important than intelligence in the success of a person. According to Goleman, IQ accounts for only 20% of a person's success in life. The balance can be attributed to EI E.Q. The concept of EI has brought a revolution in the field of child care, home, school, and workplace management. If the proper efforts are made for training the emotions and developing proper E.Q. potential among the people right from their childhood, then it will surely help in bringing mutual emotional understanding; empathy accompanied with right actions and behavior on the part of the Individuals and groups to lead better life in peace and co-operation.

The purpose of the study was to observe the difference, if any, on EI of height-weight-matched early teen school students of rural and urban area, taking into account a variety of demographic and contextual factors. It is essential for educators, counselors, and policymakers to comprehend these distinctions to develop interventions that are specifically designed to enhance emotional well-being and facilitate student success in a variety of environments.

MATERIALS AND METHODS

The present study was conducted on a sample of height-weight-matched 456 students. One fifty-two male students in three age categories of 13, 14, and 15 years of age from two rural and urban locality schools were the subjects. Their height and weight were matched according to age groups. Students from school of Kalyani, Nadia District, Banipur, North 24 Parganas, Malda District, Murshidabad District, Uttar and Dakshin Dinajpur District of West Bengal were selected for the study. Height-weight range of the subjects is given in Table 1.

As a measure of EI, the Bengali version of EI Inventory by Mangal, S.K. and Mangal, S. (2004) was used. Mean standard deviation (SD), analysis of variance, and independent *t*-test were used for assessment and interpretation of data. For statistical calculations, the Statistical Package for the Social Sciences software version 20 was used.

RESULTS AND DISCUSSION

Table 2 represents the description of the data of three age groups in the form of mean and SD.

In 13-year age group, the scores of EI were 59.35 ± 10.74 for rural area and 58.88 ± 9.90 for urban area. In 14-year age group, the scores of EI were 63.82 ± 11.51 for the rural area and 67.51 ± 8.49 for urban area. In 15-year age group, the scores of EI were 67.64 ± 12.29 and 70.20 ± 11.60 for rural and urban areas, respectively.

Table 3 showed the scores of EI 63.18 ± 11.87 and 65.15 ± 10.88 for rural and urban areas. The t-ratio of EI was 1.95, and the tabulated t-ratio was 1.66. The calculated t-ratio was higher than the tabulated t-value. According to locality, the EI was statistically significant at 0.05 level.

The calculated F-value of 28.35 was greater than the critical F-value ($P < 0.05$). Therefore, the difference of EI among the three age groups was statistically significant. From the calculations, it was observed that a statistically significant difference existed between the students of 13-year and 14-year, 14-year and 15-year, and also 15-year and 13-year groups.

Saikia (2015) revealed that the majority of adolescents of urban culture projected more capacities of EI than the adolescents of rural culture. Mahato (2016) observed that the adults of urban area are more able in identifying their feelings, of others, and can handle their emotions well, as compared to the rural people

Table 1: Range of height and weight of the subjects

Age (years)	Height (cm)	Weight (kg)
13	150–156.5	39–44
14	156.5–163	44–49.5
15	163–168.5	49.5–55.5

Table 2: Descriptive statistics of emotional intelligence

Age group Locality	13-year Mean±SD	14-year Mean±SD	15-year Mean±SD	Total Mean±SD
Rural	59.35±10.74	63.82±11.51	67.64±12.29	63.18±11.87
Urban	58.88±9.90	67.51±8.49	70.20±11.60	65.15±10.88
Total	59.12±10.32	65.67±10.00	68.92±11.95	

SD: Standard deviation

Table 3: t-ratio of emotional intelligence of school students according to locality

Rural (Mean±SD)	Urban (Mean±SD)	t-ratio	Tabulated t-value	Significance level
63.18±11.87	65.15±10.88	1.95	$t_{0.05}$ 454=1.66	0.05*

*Significant at 0.05 level. SD: Standard deviation

Table 4: ANOVA on emotional intelligence of students according to age

Variables	Age-wise value of Mean±SD			F-value	Inter-group t-ratio		
	13-year	14-year	15-year		13 versus 14	14 versus 15	15 versus 13
EI	59.16±10.39	65.36±10.49	68.64±12.04	28.35	5.24*	2.52*	7.23*

*Significant at 0.05 level ($F_{0.05}453=2.30$). ANOVA: Analysis of variance, SD: Standard deviation

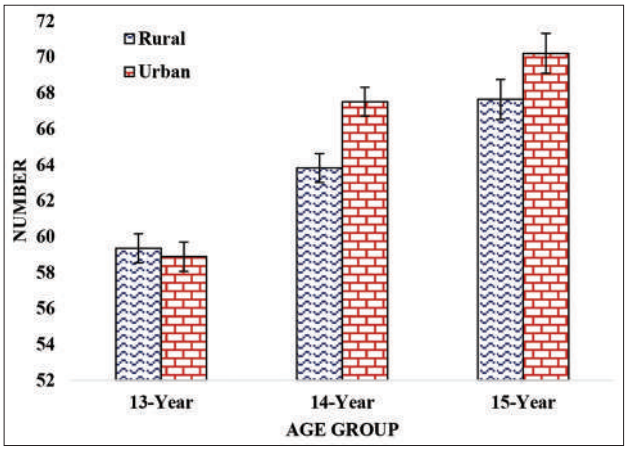

Illustration No. 1: Graphical presentation of emotional intelligence (Data are the means ± SE bars).

who mostly express their emotion without much thinking sometimes it's good, but in some cases, it can put a negative effect whereas the people of urban area handle their emotion intelligently.

In that study, there could be several factors behind this difference; it could be the education and environment, culture, facilities, socioeconomic condition, they acquire.

CONCLUSION

The height-weight-matched early teen school students of urban area were better in EI as compared to rural area.

According to age, the higher was the age, the higher was the EI among the height-weight-matched early teen school students of urban and rural areas.

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Research Article

Game-based learning in physical education: Teachers' awareness and application

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ABSTRACT

Engagement and motivation were central challenges in physical education (PE), especially in higher education settings where traditional approaches did not always align with students' evolving learning preferences. Game-based learning (GBL) had been identified in global research as a strategy that enhanced motivation, participation, and skill development, yet its use in Philippine higher education PE remained underexplored. This study investigated the awareness and extent of application of GBL among 35 PE teachers at Batangas State University. Specifically, it examined teachers' knowledge of GBL in terms of instruction and assessment, and their reported use of GBL strategies in PE courses. Using a descriptive research design, data were gathered through a researcher made questionnaire and analyzed using weighted means and verbal interpretation scales. Findings revealed that teachers demonstrated moderate awareness of instructional practices such as points, levels, and structured competition, but showed limited familiarity with narrative framing, reflective debriefing, and holistic assessment methods. Similarly, application of GBL was largely confined to practical, low preparation strategies, while more innovative, student-centered approaches were underutilized. The study concluded that teachers relied on surface level gamification rather than fully integrating GBL into pedagogy and assessment. It recommended targeted professional development, provision of ready to use resources, and classroom-based validation studies to strengthen GBL implementation.

Keywords: Assessment, Game-based learning, Instructional strategies, Physical education, Student engagement

INTRODUCTION

Getting students involved and interested is vital for effective teaching and learning in physical education (PE) classes. At Batangas State University (BatStateU), PE is a required subject, but many teachers struggle to sustain student motivation, especially in an era where technology heavily shapes learning preferences. Traditional approaches – often repetitive exercises taught with rigid instructions – sometimes discourage participation and diminish students' interest. To address this challenge, game-based learning (GBL) has emerged as a promising strategy that integrates play, competition, and collaboration into PE instruction. By turning lessons into interactive and enjoyable experiences, PE educators at BatStateU can better align with students' digital habits and diverse learning styles, making physical activities more engaging and worthwhile (Louk *et al*., 2024; de Oliveira *et al*., 2024).

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The benefits of GBL are evident in both research and practice. Studies show that students engaged in game-based PE report higher levels of participation and motivation compared to traditional methods (Louk *et al*., 2024). Beyond increased engagement, this approach enhances learning outcomes by improving motor skills, conceptual understanding, and overall achievement (Louk *et al*., 2024). Moreover, tailoring activities to individual needs and incorporating competitive yet inclusive elements help foster personalization and inclusivity in PE (de Oliveira *et al*., 2024; Toh and Koh, 2024). Effective strategies for implementation include the use of technology such as fitness apps and interactive games, setting achievable goals to build confidence, and providing continuous feedback

that reinforces effort and progress (Oliveira *et al*., 2024). Taken together, these practices suggest that adopting GBL in BatStateU's PE curriculum can create a more motivating, inclusive, and student-centered learning environment.

Studies across different countries consistently show that GBL enhances student motivation, participation, and retention in PE. When teachers incorporate elements such as point systems, scoreboards, storytelling, and team challenges, students not only become more engaged but also develop skills in teamwork, discipline, and problem-solving (Kosulin *et al*., 2024; Clarice *et al*., 2023). These mechanics foster emotional involvement and enjoyment, which, in turn, improve both performance and commitment to learning (Hartt *et al*., 2020; Gao *et al*., 2024). For students at Batangas State University, where traditional PE methods often struggle to capture sustained interest, integrating such strategies could transform the classroom into a more interactive and meaningful environment.

However, the effectiveness of GBL depends heavily on teachers' preparedness. If educators lack sufficient understanding of game mechanics or fail to plan and evaluate activities properly, GBL risks devolving into mere entertainment rather than a structured tool for learning (Camacho-Sánchez *et al*., 2023). This makes teacher training, collaboration, and institutional support critical for successful implementation (Gao *et al*., 2024). Adequate resources and curriculum integration are also necessary to ensure that GBL serves its educational purpose rather than becoming a distraction. For this reason, it is important to examine how PE teachers at BatStateU currently understand and apply GBL, since their knowledge, planning, and execution ultimately determine whether it enhances learning outcomes or falls short of its potential.

In the Philippines, and particularly at Batangas State University (BatStateU), research on GBL in PE remains scarce. While studies in other subject areas have demonstrated the value of game-based methods, little is known about how PE teachers in higher education implement such strategies. This gap is significant because PE at BatStateU is not only about mastering physical skills but also about cultivating teamwork, problem-solving, and lifelong health practices. Exploring teachers' knowledge and use of GBL is therefore essential to introducing innovative pedagogies that align with the university's vision of producing globally competitive and community-oriented graduates.

Existing literature suggests that GBL fosters increased engagement and motivation, making PE lessons more interactive and enjoyable (Ningsih, 2024). It also supports the development of both motor and cognitive skills, contributing to holistic student growth (Culajara, 2022; El-Tanahi *et al*., 2023), while encouraging teachers to adopt adaptable and creative instructional strategies (Culajara, 2022). Despite these benefits, challenges remain. Studies highlight the limited research on GBL in higher education PE, especially in the Philippine context, underscoring the need for deeper investigation (Garcia Álvarez *et al*., 2022). Moreover, teachers often encounter barriers to effective implementation, such as lack of training, resources, or institutional support, which can hinder its potential impact (Jarrett, 2022). Addressing these gaps provides a strong rationale for examining how BatStateU PE teachers understand and apply GBL in their classes.

This study tries to fill this gap by looking at how much 35 PE teachers at BatStateU know about GBL and how much they actually use it. The research specifically wants to find out how well teachers understand GBL in terms of teaching and testing students, and to see how much they actually apply GBL in their PE courses. By focusing on BatStateU, this research provides evidence that can help improve teacher training, make the curriculum better, and create university policies that keep students engaged in PE through new and creative teaching methods.

Objectives

1. Identify the PE teacher's level of awareness in GBL in terms of:
   1.1 Instruction
   1.2 Assessment
2. Determine the extent of application of GBL in PE courses.

METHODOLOGY

This study employed a descriptive research design to examine the awareness and application of GBL among PE teachers. The respondents were 35 PE teachers from Batangas State University, all of whom were included in the study, so no sampling method was used. Data were gathered through a researcher-made questionnaire, which focused on two main dimensions. These were teachers' awareness of GBL in terms of instruction and assessment, and the extent of its application in PE courses. To analyze the responses, the study used weighted mean and verbal interpretation scales to determine the overall level of awareness and application.

Scoring of responses

- 4.50–5.00 = Very Aware/Highly Applied
- 3.50–4.49 = Moderately Aware/Moderately Applied
- 2.50–3.49 = Slightly Aware/Slightly Applied
- 1.00–2.49 = Not Aware/Not Applied

RESULTS

Objective 1: PE Teacher's Level of Awareness in GBL

The results show that PE teachers are fairly familiar with some aspects of using GBL for instruction, particularly when

it comes to common practices like using points, teams, and levels, or balancing competition and cooperation in class. These are strategies that naturally fit into traditional PE settings, so teachers tend to be more comfortable applying them. However, the level of awareness is not at its highest, which means there is still room for deeper understanding and refinement of these practices. Teachers may know these strategies exist and have used them before, but not to the extent that they feel fully confident in applying them consistently and purposefully in different contexts.

On the other hand, teachers show lower awareness in areas such as framing narratives and facilitating debriefing sessions. These are more advanced strategies that require not just structuring a game but also guiding students to connect experiences to learning goals. The lack of strong awareness here suggests that while teachers can run engaging games, they may miss opportunities to maximize their instructional value by tapping into student motivation through storytelling or helping them reflect after the activity. Overall, the results suggest that teachers need more support in going beyond surface level gamification to truly integrate GBL as a structured instructional approach.

In terms of assessment, the findings reveal that teachers' awareness is generally limited. They show some recognition of how in-game metrics such as scores or repetitions can serve as formative checks, but this awareness does not extend strongly to more complex or holistic assessment methods. Assessing strategy, decision making, and quality of movement through games seems less familiar to them, which indicates a narrow view of what GBL assessment can capture. This highlights that while teachers may be comfortable using games to engage students, they are less confident in using them to measure learning outcomes.

The weakest area lies in creating structured rubrics and applying peer assessment in a GBL context. This gap suggests that teachers often do not see GBL as a valid avenue for evaluating cognitive, affective, and psychomotor domains together. Without structured tools, assessment in GBL may remain informal and inconsistent. The implication is that while instruction can be somewhat game oriented, evaluation practices still follow more traditional methods, which may limit the educational impact of GBL. Teachers would benefit from training on how to design and use rubrics tailored to GBL activities to ensure assessments are both systematic and aligned with intended learning outcomes.

Objective 2: Extent of Application of GBL in PE Courses

The results show that teachers are able to apply certain GBL practices more consistently than others. Strategies such as using countdowns or timed challenges, creating cooperative team goals, and managing limited resources are applied more often. These approaches are relatively easy to integrate into lessons because they do not require major changes in planning or additional materials. They also align naturally with the competitive and cooperative nature of PE classes, which explains why teachers find them practical to implement. This demonstrates that teachers are willing to apply GBL when the strategies are simple and manageable in a classroom or gym setting.

In contrast, teachers apply less frequently the more innovative or student centered elements of GBL, such as badges, role playing, creative narratives, and student designed games. These require more preparation, creativity, or flexibility, which may be challenging given class sizes, time limitations, and curriculum demands. The results indicate that while teachers are open to applying GBL, they tend to rely on straightforward methods that fit within their comfort zone. This suggests a gap between knowing about innovative GBL practices and having the capacity or resources to use them consistently in real teaching situations. Professional development that introduces ready to use templates or sample activities could help bridge this gap.

DISCUSSION

PE Teacher's Awareness in GBL

The findings on PE teachers' awareness highlight an interesting divide between familiarity with surface level gamification strategies and deeper pedagogical approaches in GBL. The fact that teachers were more aware of common practices such as points, teams, and structured competition aligns with the idea that gamification naturally fits within traditional PE contexts. However, limited awareness of narrative framing, reflective debriefing, and holistic assessment suggests that GBL is still being perceived more as an engagement tool than as a structured instructional framework. This supports earlier claims from educational researchers that many teachers stop at the motivational layer of gamification and rarely move toward integrating it with higher order learning objectives.

The new aspect emerging from this study is the gap between instructional familiarity and assessment integration. While literature on GBL often emphasizes its power to measure cognitive, affective, and psychomotor domains simultaneously, this study shows that PE teachers in the local context struggle to translate that theory into practice. This limitation could be tied to a lack of training and resources that demonstrate how to build structured rubrics or reflective tools in a GBL setting. Such findings imply that while awareness exists, professional development must focus not just on what GBL strategies are but also on how to transform them into valid and reliable assessment practices.

Table 1: Awareness as to instruction

No.	Indicator	Weighted mean	Verbal interpretation
1	I am aware of how to design game mechanics that align with specific PATHFIT learning competencies (e.g., using a tag game to teach agility and aerobic endurance).	3.46	Moderately Aware
2	I am aware of strategies for framing a game's narrative or challenge to maximize student motivation and engagement from the start.	3.20	Slightly Aware
3	I am aware of how to implement game elements such as points, levels, or teams to create a structured and motivating GBL environment.	3.65	Moderately Aware
4	I am aware of techniques for facilitating debriefing sessions to help students extract and connect key fitness learnings from the game experience.	3.00	Slightly Aware
5	I am aware of how to balance competition and cooperation in game design to ensure inclusivity and a positive learning climate.	3.55	Moderately Aware
	Composite Mean	3.37	Slightly Aware

Table 2: Awareness as to assessment

No.	Indicator	Weighted mean	Verbal interpretation
1	I am aware of how to use in-game metrics (e.g., completed challenges and repetitions) as formative assessment of skill practice.	3.30	Slightly Aware
2	I am aware of methods to assess and provide feedback on students' employ of strategy and decision-making within the game context.	2.95	Slightly Aware
3	I am aware of how to design assessments that evaluate both the fitness outcome (e.g., heart rate) and the quality of movement during game play.	2.75	Slightly Aware
4	I am aware of using peer-assessment techniques within game teams to evaluate collaboration and communication skills.	2.85	Slightly Aware
5	I am aware of how to create a GBL rubric that assesses performance across cognitive (rules), psychomotor (skills), and affective (teamwork) domains.	2.60	Slightly Aware
	Composite Mean	2.89	Slightly aware

A notable limitation of this objective is the reliance on self-reported awareness through a researcher made questionnaire, which may not fully capture actual classroom practices. The relatively small pool of respondents also limits the generalizability of the findings. Future research should consider classroom observations or intervention based studies to validate whether the self-reported awareness translates into consistent practice. In addition, follow-up research can investigate how teacher training in reflective facilitation and assessment design can strengthen the integration of GBL beyond surface level gamification.

Extent of Application of GBL in PE Courses

The application of GBL by PE teachers reveals a practical orientation, where strategies requiring fewer resources and minimal preparation are prioritized. The tendency to rely on time based challenges, resource management, and cooperative goals resonate with the core nature of PE as an environment that thrives on competition, teamwork, and movement efficiency. However, the limited application of more student centered approaches such as role playing, creative narratives, and badge systems indicates that while teachers see value in gamification, they often avoid practices that demand higher preparation time or curriculum flexibility. This supports previous research pointing out that teachers are more likely to adopt GBL strategies that fit within their existing routines rather than those requiring significant adaptation.

What is significant here is the emerging gap between teacher comfort zones and the innovative potential of GBL. The reluctance to apply immersive and student driven strategies may reflect not just logistical barriers but also a pedagogical mindset that views PE primarily as skill and fitness training rather than as a platform for creativity, problem-solving, and ownership of learning. This suggests that the application of GBL in local PE settings remains underdeveloped compared to its theoretical possibilities. The implication for practice is that professional development should emphasize not only ready to use activities but also mindset shifts that allow teachers to see GBL as a transformative tool rather than a classroom add on.

The study, however, is limited by its scope, as the extent of application was measured only through teacher self-reports. This raises concerns about whether reported practices are consistently applied across lessons or simply used occasionally.

Table 3: Extent of application of game-based learning

No.	Indicator	Weighted mean	Verbal interpretation
1	I use points, scores, and leaderboards to motivate students and provide immediate feedback on performance in fitness challenges.	3.40	Moderately Applied
2	I implement levels or progressive tiers of difficulty in games to ensure activities are developmentally appropriate and challenging.	3.25	Slightly Applied
3	I utilize badges or achievement systems to recognize mastery of specific skills (e.g., proper throwing form and sustained aerobic activity).	2.80	Slightly Applied
4	I create game narratives or themes (e.g., "Olympic Mission," and "Zombie Escape") to increase immersion and engagement in fitness activities.	3.10	Slightly Applied
5	I apply time constraints or countdowns in games to increase intensity and simulate performance under pressure.	3.95	Moderately Applied
6	I use role-playing elements (e.g., assigning specific team roles like "strategist" or "equipment manager") to teach responsibility and teamwork.	3.15	Slightly Applied
7	I implement resource management challenges (e.g., limited equipment) to encourage creativity and problem-solving during activities.	3.45	Moderately Applied
8	I design games that require collective team goals to be met, promoting cooperation over individual competition.	3.60	Moderately Applied
9	I utilize quick, game-based formative assessments (e.g., 'show me your answer by moving to this cone") to check for understanding.	3.05	Slightly Applied
10	I provide opportunities for students to modify existing game rules or create their own games to foster ownership and creativity.	2.95	Slightly Applied
Composite Mean		3.27	Slightly Applied

Another limitation is that the instrument was distributed online, which could have restricted participation due to internet connectivity issues, possibly excluding teachers who might have different experiences. Future research should incorporate classroom based validations, case studies, or even experimental designs where GBL strategies are systematically implemented and evaluated. Exploring how student feedback interacts with teacher application could also provide a fuller picture of GBL's effectiveness in PE.

CONCLUSION

Based from the results, the study concluded that PE teachers demonstrate surface level awareness of GBL but lack depth in applying reflective and assessment driven strategies. Moreover, the application of GBL in PE courses remains limited to practical, easy to use methods, leaving more innovative, and student-centered approaches underutilized.

Recommendations

Based from the conclusions, the study recommended that PE teachers at Batangas State University should pursue professional development in advanced GBL strategies, focusing on reflective debriefing and structured assessment methods to move beyond surface level gamification. Furthermore, the administration should provide ready to use templates and resources for innovative GBL activities, including implementation guides and assessment rubrics to support teacher application. Finally, future researchers should conduct classroom-based validation studies with student feedback to examine actual GBL implementation and explore peer collaboration systems for teacher development.

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Research Article

Henri Fayol's management functions in sports: An assessment of planning and organizing skills of bachelor of physical education students

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ABSTRACT

This study assessed the planning and organizing skills of bachelor of physical education (BPED) students at Batangas State University using Henri Fayol's management functions as a framework. A descriptive research design was employed, involving the total population of BPED students from 1st to 4th year levels. Data were gathered through a researcher made questionnaire that focused on students' personal attributes and their manifestation of planning and organizing in sports related activities. Findings revealed that BPED students demonstrated positive personal attributes such as initiative, responsibility, and problem-solving, which supported their potential in sports management. In terms of management functions, students showed a moderate level of planning and organizing skills. Strengths were noted in goal setting, task delegation, and participation in sports activities, while areas such as consistency, adaptability, and contingency planning required further improvement. The study concluded that BPED students possessed the foundational competencies for sports leadership but needed enhanced experiential learning, structured mentorship, and real-world opportunities to fully develop advanced management skills. Based on these findings, it was recommended that the BPED program must strengthen practical training, provide leadership workshops, and expand community-based sports programs to further improve students' management competencies.

Keywords: Bachelor of physical education students, Henri Fayol, Organizing, Planning, Sports management

INTRODUCTION

Sports management is a field that keeps changing and requires both technical knowledge and the skill to coordinate people, resources, and activities effectively. At the college level, Bachelor of Physical Education (BPED) students need to develop abilities that go beyond just physical skills. They must also build leadership and organizational skills that are important for sports settings. Recent studies show that there is a need for a unified framework of sport management skills, including planning, organizing, and communication, to meet what modern sports environments require (Guidotti *et al*., 2023). Among different management theories, Henri Fayol's management functions, especially planning and organizing, give a solid foundation for understanding and checking these skills. Planning helps people set goals and figure out the best way to take action, while organizing makes sure tasks and resources are distributed properly to reach goals efficiently. Due to this, Fayol's ideas are still useful today, particularly in educational settings where structured management methods are needed for developing leadership in sports (McNamara, 2018).

Based on this foundation, using management principles, particularly Fayol's functions of planning and organizing, is important in both sports and physical education settings. Good planning makes sure that training sessions are organized to meet what athletes need for development, balancing skill learning with performance goals (Facchini *et al*., 2025). At the same time, this supports successful event execution, as shown by the Olympic and Paralympic Games, which need careful coordination and resource management (Groschl, 2021). In the same way, organizing encourages collaboration, fair

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distribution of responsibilities among coaches and athletes, and the ability to adapt to different motivations and skill levels, making overall program execution better (Facchini *et al*., 2025). However, even though these functions are recognized as important, turning these theories into practical activities for students in physical education and sports remains inconsistent. This shows the need for a deeper look at how Fayol's principles can be used effectively.

Research also shows both the benefits and challenges of using these management functions in sports education. Structured planning has been connected to better resource use and improved student outcomes in PE settings (Ridha *et al*., 2024), while effective organizing improves communication, collaboration, and creates supportive environments for athletes (Febrian *et al*., 2024). However, students often have trouble applying management principles in real world situations without proper practical training (Amalia *et al*., 2024). The lack of clear management models in sports education adds to inefficiencies and stops the development of effective programs (Carranza Bautista *et al*., 2024). Together, these findings show the need to include Fayol's planning and organizing principles into hands on learning experiences within sports and physical education.

At the institutional level, Batangas State University BPEd students actively take part in organizing and joining sports events, classroom activities, and community based programs. This gives plenty of opportunities to apply theoretical knowledge in real world settings. This involvement is important for developing personal qualities like leadership, responsibility, and teamwork, which help support their planning and organizing skills. Leadership development is particularly notable, as participation in sports has been shown to strengthen leadership abilities. Students also show strengths in personal conduct and self-awareness, which are needed for guiding teams and managing programs successfully (Liu and Chang, 2024).

In addition, involvement in campus organizations further develops teamwork and responsibility, skills that are important for future PE teachers and sports managers (Mustaqim and Wahjoedi, 2024). As a result, students involved in these programs show better academic performance and employability, showing how collaborative experiences improve collective goal achievement (Mustaqim and Wahjoedi, 2024). Furthermore, applying theoretical knowledge through sports and community programs strengthens students' planning and organizing abilities, preparing them for professional roles in education and sports management (Edris *et al*., 2025; Guo, 2024). Still, challenges like balancing academic responsibilities with organizational tasks can affect how effective these learning experiences are, showing the need for structured guidance and support (Mustaqim and Wahjoedi, 2024).

Based on these insights, this study addresses the gap by checking the planning and organizing skills of BPED students through Henri Fayol's management functions. Specifically, the study identifies the personal attributes of students that are relevant to sports management, evaluates how much they show planning and organizing in sports related activities, and determines the relationship between these attributes and their management skills. The findings are expected to provide insights into how ready BPED students are for future professional roles and inform curriculum development that strengthens both their teaching and management abilities.

Objectives

1. Identify the personal attributes of BPED students in managing sports related activities
2. Assess the extent of manifestation of Henry Fayol's management functions in sports-related activities as to:
   - Planning
   - Organizing.

METHODOLOGY

This study used a descriptive research design to examine the management skills of BPED students in sports related activities at Batangas State University Pablo Borbon Campus. The respondents included all 146 BPED students from all year levels. The researchers collected data using a questionnaire that they constructed themselves, which focused on students' personal attributes and how they show Henri Fayol's management functions, specifically planning, coordinating, and organizing. The questionnaire was developed based on reviewing related literature and was given face to face, with the purpose and instructions explained to participants. The researchers then analyzed the data weighted mean to determine students' personal attributes and the manifestation of their Henry Fayol's' management functions. Responses were scored using a 4 point Likert scale with corresponding verbal interpretations:

Option	Scale range	Verbal interpretation
4	3.50–4.00	Strongly agree/highly manifested
3	2.50–3.49	Agree/moderately manifested
2	1.50–2.49	Disagree/slightly manifested
1	1.00–1.49	Strongly disagree/least manifested

RESULTS

Personal attributes of the students. Table 1 presents the personal attributes of BPED students in managing sports-related activities.

Table 1: Personal attributes

Personal attributes	Weighted mean	Verbal interpretation
1. Shows interest in organizing and managing sports events.	3.37	Agree
2. Assisted sports activities at school like intramurals.	3.28	Agree
3. Participates in organizing sports events.	3.27	Agree
4. Display personal commitment and passion to achieve success in sports activities.	3.27	Agree
5. Able to clearly explain tasks and inspire others with perspectives in sports activities.	3.24	Agree
6. Able to solve problems encountered in sports related activities.	3.20	Agree
7. Display interest in managing sports leagues in the community.	3.11	Agree
8. Attended sports clinics and programs in the community.	3.10	Agree
9. Participated in a seminar about sports management.	3.95	Agree
10. Experienced being a committee in sports activity.	2.90	Agree
Composite mean	3.17	Agree

The findings show that BPED students generally have positive personal attributes in sports participation and management, as shown in their overall agreement across the indicators. They show interest in organizing and helping with school-based sports activities, demonstrate commitment and passion, and have the ability to inspire and solve problems in sports related contexts. This shows that students are developing the basic qualities expected of future physical educators, particularly in terms of initiative, responsibility, and teamwork.

However, the fact that the responses only reached the level of "Agree" rather than "Strongly Agree" suggests that while students recognize and display these attributes, they may not consistently or deeply show them yet. Experiences such as managing community sports leagues, attending specialized clinics, or handling more complex responsibilities appear to be less common, which may have limited their confidence and stronger self-assessment. This points to a need for broader exposure beyond school intramurals and structured seminars, giving students more opportunities to apply their skills in real world settings.

Overall, the results show that BPED students are on the right track in developing important personal attributes for sports leadership, but their confidence and experience are still growing. With better hands on learning, mentoring, and involvement in both school and community based sports activities, these attributes could develop further, eventually reaching a level that students themselves could confidently rate as "Strongly Agree."

Manifestation of Henry Fayol's management functions in sports-related activities. Tables 2 and 3 shows the manifestation of Henry Fayol's management functions in terms of planning and organizing.

The findings show that planning skills among BPED students were generally moderately manifested, with only one indicator developing clear goals consistent with agreed strategies reaching the "highly manifested" level. This suggests that students can set goals that align with broader objectives, which is an important first step in effective planning. However, when it comes to the more detailed aspects of planning, such as preparing contingency plans, managing schedules, and establishing systematic priorities, students only showed moderate ability. This pattern shows that while they understand the importance of planning, their execution of more complex or advanced planning tasks is still developing.

The results also show that BPED students may be more comfortable with straightforward aspects of planning, like identifying goals and checking progress, but they are less confident in applying advanced strategies such as time maximization, prioritization, and long-term planning. This explains why the overall composite mean remained at the "moderately manifested" level rather than reaching "highly manifested." The findings suggest that students still need more structured opportunities to practice planning in real sports contexts, where they can experience the challenges of unexpected problems, scheduling conflicts, and goal prioritization.

In summary, BPED students show promising but still developing planning abilities. Their ability to set goals shows readiness to take on leadership roles in sports events, yet the moderate ratings show that they are not fully confident in handling the complexity of real-world planning. Providing more hands-on involvement in organizing sports activities, exposure to contingency planning, and training on prioritization methods could help strengthen their planning skills. With this, their attributes could move from "moderately manifested" toward "highly manifested," aligning with the expectations for future physical educators and sports managers.

The results show that BPED students demonstrated moderately manifested organizing skills overall, with a few areas already

Table 2: Planning

Planning	Weighted mean	Verbal interpretation
Develops clear goals that are consistent with agreed strategies.	3.52	HM
Translates objectives into specific goals.	3.48	MM
Check progress periodically and make revisions if problems occur.	3.48	MM
Set the plan accurately for the main goal of the sports event.	3.47	MM
Manage schedules and timetables with clear and specific goals.	3.46	MM
Prepares clear and strategic plans before starting to work on the activity.	3.46	MM
Maximizes time and effort accurately to complete a task.	3.45	MM
Established priorities systematically, differentiating between urgent, important, and unimportant task.	3.41	MM
Prepares contingency plans for potential problems.	3.40	MM
Set short-term and long-term sport activities plan and goals to work team and individual performance objectives.	3.35	MM
Composite mean	3.45	MM

Table 3: Organizing

Organizing	Weighted mean	Verbal interpretation
Keeps a clean and ordered venue.	3.47	MM
Proper storage of sports equipment for easy access.	3.43	MM
Displays consistency in organizing even when facing challenges.	3.39	MM
Assist others to plan and organize the work.	3.47	MM
Achieve goals in a timely manner, despite obstacle encountered, by organizing.	3.46	MM
Manages multiple tasks and project focusing on key priorities.	3.52	HM
Put a written plan into action.	3.50	HM
Sequence activities and develop event schedules.	3.45	MM
Measure progress and monitor performance result.	3.44	MM
Identify and allocate resources.	3.44	MM
Composite mean	3.46	MM

reaching the "highly manifested" level. Specifically, they showed stronger abilities in managing multiple tasks while focusing on priorities and in putting written plans into action. These findings suggest that students can translate plans into concrete actions and handle tasks effectively when priorities are clear. This strength is important for sports management, as organizing often requires juggling multiple responsibilities within limited timeframes.

On the other hand, most indicators such as keeping venues orderly, storing equipment properly, sequencing activities, and monitoring performance were only moderately manifested. This suggests that while students understand the basic requirements of organizing, their consistency and efficiency in executing these tasks still need improvement. The moderate ratings may show that students perform well under guided or structured settings but are less confident when unexpected challenges arise, requiring independent initiative.

Overall, the findings suggest that BPED students are developing solid foundational organizing skills but have not yet fully mastered all aspects necessary for sports leadership and management. More hands on opportunities, such as independently handling sports events or being assigned specific organizing roles, could help them improve their abilities. Strengthening consistency and adaptability in organizing tasks would also allow them to progress from moderate to highly manifested levels, preparing them better for real world responsibilities in physical education and sports management.

DISCUSSION

Personal Attributes of BPED Students

The findings on personal attributes suggest that BPED students generally possessed positive qualities relevant to sports leadership and management, such as initiative, responsibility, and problem solving. This aligns with the expectation that

future physical educators should embody both technical competence and soft skills that support teamwork and leadership. However, the fact that the responses leaned only toward "Agree" rather than "Strongly Agree" implies that students recognized their capabilities but had not yet fully internalized or consistently demonstrated them. This indicates that while foundational attributes were present, mastery and confidence remained in progress.

Compared with earlier studies on sports leadership, which highlight the importance of experiential learning in shaping student confidence, these results support the idea that limited exposure restricts stronger development. For instance, students may have engaged in intramurals or assisted in committees but lacked opportunities in broader community based or large-scale sports events. This gap limits the depth of their leadership growth and helps explain why their self-assessments stopped short of "strongly manifested" personal attributes. In this sense, the results echo theories of experiential education that emphasizes practice and reflection as drivers of competence.

The implication for practice is clear that if BPED students are to fully develop as future sports managers and leaders, they need increased involvement in complex, authentic sports environments. While classroom learning and small school events provide a starting point, more structured immersion in community leagues, clinics, or external seminars is necessary. Limitations of the study, such as reliance on self-reported questionnaires, may also have influenced the conservative ratings. Future research should include performance-based assessments and student reflections to validate and expand on these findings.

Manifestation of Henry Fayol's Management Functions

The results of the study revealed that BPED students moderately manifested Henry Fayol's management functions of planning and organizing in sports related activities. In terms of planning, students showed strength in developing clear goals aligned with agreed strategies, but other aspects such as contingency planning, systematic prioritization, and time maximization were only moderately evident. Similarly, in organizing, students demonstrated competence in managing multiple tasks and putting written plans into action, yet areas such as keeping venues orderly, sequencing activities, and monitoring progress remained moderately manifested. These findings suggest that while students are capable of initiating goal setting and translating written plans into practice, they are still in the process of mastering more complex planning and organizing tasks required for sports management.

The moderate manifestation of both planning and organizing reflects that BPED students have a growing but not yet fully developed set of management competencies. Their ability to focus on priorities and translate plans into action indicates potential for leadership in sports events, yet their limited confidence in areas such as resource allocation, performance monitoring, and long-term planning highlights gaps in their practical readiness. This imbalance suggests that students are more comfortable working in guided and structured settings but encounter challenges when required to exercise independent judgment or deal with unexpected problems. Without stronger application of advanced planning and organizing strategies, their leadership roles in sports management may remain limited to routine or less complex tasks.

Overall, the findings point to the need for deeper experiential learning that integrates both planning and organizing into real world practice. By engaging students in activities that require them to set priorities, manage resources, and monitor outcomes, they can gradually build confidence and consistency in applying management functions. Practical opportunities such as handling entire sports events, developing contingency plans, and independently leading organizational tasks would help bridge the gap between moderate and highly manifested competencies. Strengthening both planning and organizing together is crucial, as these functions complement one another and form the backbone of effective sports leadership. With targeted mentoring and exposure, BPED students could advance toward demonstrating highly manifested management skills aligned with the expectations of future physical educators and sports managers.

CONCLUSION

Based on the results, the study concluded that BPED students demonstrated positive personal attributes in managing sports activities, but their confidence and consistency remain at a developing stage. In addition, BPED students moderately manifested planning and organizing skills, showing potential in goal setting and prioritization but needing further practice with advanced management tasks.

RECOMMENDATIONS

Based from the conclusions, the study recommended that BPED students should actively engage in more hands on sports management experiences to strengthen their planning and organizing skills. Moreover, faculty of the BPED program should provide structured opportunities and mentorship for students to apply management concepts in real sports settings. Finally, future studies should explore other management functions and use varied methods to gain deeper insights into BPED students' competencies.

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