



Developing Strategies to Promote Physical Fitness for University Students

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Received 14/09/2024

Revised 18/09/2024

Accepted 10/11/2024

Abstract

Background and Aims: The physical fitness problems of university students must be paid great attention to. As the backbone of training university students, how to guide the students to exercise scientifically and achieve the best physical fitness for effect has become an urgent problem for physical educators in universities and universities. The objective of this research was to develop strategies to promote physical fitness for university students.

Methodology: This research is mixed methods research. The population for this research includes 5,275 first-year students enrolled at Guangdong University of Foreign Studies for the 2023 academic year. Using the Taro Yamane formula, the sample size was calculated to be 371 university students. The questionnaire was distributed to 371 university students to investigate the problems and current situation of physical fitness of university students. After that, 7 experts were invited to develop a question framework for a focus group. 10 experts conducted a focus group to develop the question framework for use in the Delphi consensus, and 19 experts were invited to conduct a two-round Delphi consensus, to develop the strategies to promote physical fitness for university students. Finally, a connoisseurship method was used to confirm the developed strategies with 9 experts. The data gathered from the questionnaire were analyzed using the average and standard deviation, while consensus data were evaluated through the median and interquartile range. The established criteria for consensus required a median of ≥ 3.50 and an interquartile range of ≤ 1.50 .

Results: The strategies to promote physical fitness for university students were organized into 6 key aspects and comprised 51 factors. These 6 key aspects include: (1) Policy and Administrative Support, (2) Physical Education Curriculum and Programs, (3) Facilities and Equipment, (4) Engagement and Motivation, (5) Monitoring and Assessment, and (6) Sustainability of Fitness Programs.

Conclusion: The study emphasizes a thorough strategy for improving university students' physical fitness by addressing program sustainability, policy, curriculum, facilities, motivation, and assessment. These six tactical elements guarantee a balanced, encouraging atmosphere for sustained health and fitness.

Keywords: University Students; Physical Fitness; Promotion; Strategies

Introduction

In recent years, several surveys have shown that the physical and mental fitness of Chinese university students, especially the decline of physical fitness for level and sports quality and ability, has attracted wide attention from society. Social development, way of life, pace of life, life habits all aspects of convenience, greatly reduce the time people participate in physical activities, at the same time, the social aspects of competition pressure, anxiety, irritability, and a variety of bad emotions affect people's body and mind, leading to product people fitness for all kinds of problems. Compared with the Western developed countries, the decline of the national physical exercise level in China is more obvious (Zhang, 2023). Studies show that the level of physical exercise in the United States decreased by 32% from 1965 to 2013, while the level of physical exercise in China decreased by 45% to nearly half from 1991 to 2013, respectively. Among them, the decline rate in students' physical exercise level was the most significant (Wang, 2023). Specific to each school age group, the physical fitness of university students continues to decline significantly, and the situation is the most severe.

In 2019, the Opinions of the Ministry of Education on Deepening the Construction of Undergraduate Education and Teaching and Comprehensively Improving the Quality of Talent Training required that "Those who fail to meet the requirements of the National Physical Fitness for Standards for Students cannot graduate" (Jia, 2024). However, in recent years, the relevant provisions of the "National Physical Fitness for Standards for Students"





have not been fully implemented. Considering the actual situation, if the provisions of the "National Physical Fitness for Standards for Students" are strictly implemented, there will be a considerable number of university students will be unable to graduate. Therefore, in the actual operation process, often use the loose policy, lower the standard of free tests, or replace the physical fitness test with a physical examination. The implementation of the difficult problem and the policy as far as possible "compromise", to a certain extent, explains the management department and related units' efforts and good intentions in solving the physical fitness problems of university students (Corbin & Lindsey, 2024). The physical fitness problems of university students must be paid great attention to. As the backbone of training university students, how to guide the students to exercise scientifically and achieve the best physical fitness for effect has become an urgent problem for physical educators in universities and universities. Therefore, it is necessary to formulate targeted strategies to promote the physical fitness for of university students and improve their physical level. To sum up, whether from the policy level or from the background of the times and the realistic needs, it is urgent to formulate strategies to promote the physique and fitness of university students (Chun, 2009).

In September 2021, China's Ministry of Education held a press conference to highlight problems such as the decline in the physical fitness of university students. Wang (2021), director of the Prevention and Control Office of the Ministry of Education and director of the Department of Sports, fitness for and Art Education, stressed: " Although the physical fitness of students has improved, the problem is still serious. Problems such as myopia, obesity, and physical decline among university students have not been effectively curbed. The current physical decline of Chinese university students is serious, and the overall fitness level is worrying. The reason for the continuous decline of university students' physical fitness is mainly due to the poor lifestyle and lack of exercise. On the one hand, after entering the university, there is no teacher tracking and supervision, and sports fitness for awareness is not cultivated, which leads to a lack of motivation to actively participate in physical exercise. In addition, university students can fully take the initiative to arrange their daily time, to choose unfitness for lifestyles such as insufficient exercise, irregular work and rest, unreasonable diet, etc. Such a lifestyle damages the physical fitness of students and affects their physical and mental fitness of students. On the other hand, the development of the Internet has made many university students addicted to the online world (Mao, 2024).

Therefore, from the perspective of university and universities, this study aims to develop strategies to promote physical fitness for university students, from the construction of physical education courses, physical fitness for tests, and students' physical fitness for management mode. Consider the project of physical fitness for the test as the content of the final examination of the physical education course, and the supervision of extracurricular exercise should be enhanced, and the extracurricular exercise time should be included in the student performance evaluation system. To revise, update and improve the syllabus, training program, and teaching plan of physical education courses, aiming at adopting various ways to cultivate students' interest in participating in sports, so that they can master the correct exercise method, improve the ability of independent exercise, and develop the habit of taking part in physical exercise regularly.

Objectives

1. To survey the current situation and the problems of physical fitness of university students.
2. To draft the developing strategies to promote physical fitness for university students.

3. To confirm the developing strategies to promote physical fitness for university students.

Literature Review

1. Physical Fitness

Physical fitness is defined as a set of attributes or characteristics that individuals possess or achieve which relate to the ability to perform physical activity. These attributes can be categorized into health-related and skill-related components, all of which contribute to an individual's overall fitness and functional capacity. Physical fitness is crucial for overall health as it impacts various aspects of life, including the ability to perform daily tasks, reduce the risk of chronic diseases, improve mental health, and enhance the quality of life. Regular physical activity and fitness maintenance can lead to improved cardiovascular health, stronger muscles and bones, better flexibility, and healthier body composition (Koutek, 2004).

The Components of physical fitness are as follows:

1. Cardiorespiratory Endurance. The ability of the heart, lungs, and circulatory system to supply oxygen to working muscles during sustained physical activity. Enhances overall cardiovascular health and stamina, reducing the risk of chronic diseases like heart disease and diabetes (American University of Sports Medicine, 2014).

2. Muscular Strength. The maximum amount of force a muscle or group of muscles can exert in a single effort. Crucial for performing daily tasks and activities and contributes to maintaining healthy bone density and metabolic rate (Faulkner & Larkin, 1985).

3. Muscular Endurance. The ability of a muscle or group of muscles to sustain repeated contractions or to continue applying force against a fixed object over time. Important for activities requiring prolonged effort and helps in improving overall functional performance and reducing fatigue (Haskell et al, 2007).

4. Flexibility. The range of motion available at a joint or group of joints enhances mobility and decreases the risk of injuries related to muscle strain and joint stiffness. It also improves overall posture and balance (Koutek, 2004).

5. Body Composition. The ratio of lean body mass (muscles, bones, organs) to body fat. A healthy body composition is crucial for optimal health and performance. It helps in assessing the risk of obesity-related conditions and overall physical well-being (Gallagher et al, 1996).

2. Physical fitness of university student

2.1 Concept of physical fitness of university students

Physical Fitness of University Students refers to the overall health and functional capacity of students to perform daily academic, social, and physical activities effectively. University students are often at a transitional phase in life, where physical fitness plays a crucial role in their mental health, academic performance, and overall well-being. However, studies show that physical activity levels among university students tend to decline due to academic pressures, lifestyle changes, and other factors, which can negatively impact their health (Bray & Born, 2004).

The Importance of physical fitness for university students is as follows: (1) Health Benefits, physical fitness helps prevent chronic diseases such as obesity, diabetes, cardiovascular diseases, and hypertension, which can develop due to sedentary behaviors in university life (Keating et al, 2005); (2) Mental Health, engaging in regular physical activity has been shown to reduce stress, anxiety, and depression, which are common challenges faced by university students (Biddle & Asare, 2011); (3) Academic Performance, physical fitness positively correlates with cognitive functions such as memory, attention, and learning, leading to better academic performance among students (Fedewa & Ahn, 2011).



2.2 Current issues in university students' physical fitness

Many university students experience a decline in physical activity due to busy schedules, lack of motivation, or the absence of structured physical education programs. Reduced physical activity negatively affects overall health, leading to weight gain, muscle loss, and increased risk for chronic diseases (Bray & Born, 2004). Many students spend a large portion of their day sitting in lectures, studying, or using digital devices. Prolonged sitting can contribute to physical deconditioning, weight gain, and posture-related issues. Prolonged sedentary behavior has been linked to a higher risk of cardiovascular disease, obesity, and mental health problems such as anxiety and depression. Furthermore, academic responsibilities, social activities, and part-time work commitments often lead students to deprioritize physical fitness. Moreover, a lack of motivation, insufficient knowledge, or interest in fitness-related activities may prevent regular participation. Without sufficient time and motivation, students are less likely to adopt consistent exercise routines, which may result in reduced physical fitness and negative impacts on health (Keating et al, 2005). Although many universities offer gym facilities and sports programs, access to these resources may be limited due to high demand, limited hours, or insufficient space. This lack of availability can deter students from maintaining regular exercise habits, without adequate access to fitness resources, students may find it challenging to engage in structured physical activities, contributing to poor fitness levels. Despite the availability of fitness classes, intramural sports, and health programs, many students choose not to participate. This may be due to a lack of interest, discomfort with physical activity, or competing priorities, but low participation rates in fitness programs reduce opportunities for students to improve their physical fitness and mental well-being (Sparling & Snow, 2002).

3. Theory of Strategy

Strategy refers to the systematic principles and frameworks used to understand, formulate, and implement strategies that help organizations or individuals achieve their objectives effectively. Strategy theory involves planning, decision-making, and the alignment of resources to attain a desired goal in a competitive or complex environment. It is a foundational concept in various fields, including business, military, education, sports, and government.

3.1 Key elements of strategy theory

3.1.1 Strategic Objectives. The clear and specific goals that an organization or individual aims to achieve. Strategic objectives serve as the guiding force behind all strategic activities and decisions.

3.1.2 Competitive Advantage. A unique position that allows an organization to outperform its rivals by offering superior value or achieving greater efficiency. Achieving competitive advantage ensures that an organization remains relevant and successful in its domain.

3.1.3 Strategic Alignment. The process of aligning resources, capabilities, and actions with the organization's overall objectives and external environment. Strategic alignment ensures that all parts of the organization work in harmony towards common goals.

3.1.4 SWOT Analysis (Strengths, Weaknesses, Opportunities, Threats). A framework for identifying and analyzing internal and external factors that can impact an organization's strategy. It helps in understanding an organization's current position and the environment in which it operates, guiding the development of strategies that leverage strengths and address weaknesses.

3.1.5 Resource-Based View (RBV). A strategic framework that focuses on an organization's internal resources and capabilities as the main source of competitive advantage.



It emphasizes the importance of building and maintaining valuable, rare, and inimitable resources.

3.1.6 Porter's Five Forces Model. A framework developed by Michael Porter to analyze the competitive forces within an industry, influencing strategic decisions. Five Forces are as follows: (1) Threat of new entrants; (2) Bargaining power of suppliers; (3) Bargaining power of buyers; (4) Threat of substitute products or services; (5) Rivalry among existing competitors.

3.1.7 Blue Ocean Strategy. A strategy that focuses on creating new, uncontested market spaces rather than competing within existing markets (referred to as "red oceans"). It encourages innovation and value creation, moving away from traditional competition. (Porter, 1980).

Therefore, the theory of strategy involves understanding the interplay between internal capabilities, external forces, and long-term goals. It provides a framework for decision-making that helps organizations and individuals effectively navigate complex environments and achieve sustained success.

3.2 The key components of strategy

The key components of strategy provide a structured framework that guides organizations or individuals in achieving their objectives effectively. These components ensure that a strategy is comprehensive, actionable, and aligned with the desired outcomes. The primary components of the strategy are as follows:

3.2.1 Vision and Mission. Vision and mission define the direction and the reason for existence, inspiring both stakeholders and employees. Vision is the long-term aspirational goal that describes what an organization wants to achieve in the future. The mission is the organization's purpose and the core values guiding its operations.

3.2.2 Goals and Objectives. Goals and objectives translate vision and mission into tangible outcomes that can be tracked and assessed. Goals are broad, general intentions that outline what the organization aims to accomplish. Objectives are specific, measurable actions that support the achievement of broader goals.

3.3.3 Environmental Analysis. Internal Analysis is an evaluation of the organization's internal strengths and weaknesses (e.g., resources, capabilities, processes). External Analysis is an examination of external factors that can impact the organization, such as competition, industry trends, and economic conditions (e.g., SWOT analysis, PESTLE analysis). Helps the organization understand its position in the marketplace and adapt its strategy to maximize opportunities and mitigate risks.

3.3.4 Implementation Plan. The detailed plan outlines the specific actions, timelines, and responsibilities for executing the strategy. Without an actionable implementation plan, strategies often fail due to a lack of coordination, unclear roles, or insufficient resources.

3.3.5 Monitoring and Evaluation. The process of tracking progress and assessing whether the strategy is yielding the desired results. May involve performance indicators such as financial metrics, participation rates, or customer satisfaction surveys. Monitoring allows for timely adjustments and ensures that the organization remains on track toward its goals.

3.3.6 Feedback and Adaptation. The process of learning from the results of the strategy's implementation and adjusting improves future outcomes. The ability to adapt a strategy ensures that the organization remains flexible and responsive to changes in the environment.

3.3.7 Risk Management. Identifying, assessing, and mitigating risks that could hinder the success of the strategy. Effective risk management helps the organization anticipate challenges and avoid or minimize potential setbacks.

3.3.8 Sustainability and Long-Term Considerations. Ensuring that the strategy is not only focused on short-term gains but also built to sustain success in the long run. Long-term

sustainability is key for maintaining strategic advantages and achieving lasting results (Mintzberg & Quinn, 1991).

The key components of strategy—from setting a clear vision and objectives to allocating resources and managing risks—are essential in creating a roadmap for success. These components work together to guide organizations in a competitive and ever-changing environment, ensuring that they can achieve their desired outcomes in the most efficient way possible (Barney, J. B., 1991).

4. Summaries of Literature and Research Review

At present, the rate of poor physical fitness of students across the country continues to rise, especially the physical fitness of university students in China is declining, which has caused people serious attention. The main problems stem from a poor lifestyle and a lack of exercise, which leads to a decline in physical fitness. The government has issued relevant policies to emphasize the physical education courses in university and universities and include physical examination in the evaluation, but the actual implementation faces challenges.

Therefore, it is urgent to establish physical education courses to enhance the physique of university students and improve their fitness status. Scholars have found that problems such as obesity and reduced endurance are caused by unfitness lifestyles, family factors, and inadequate physical education in university and universities. The improvement measures include optimizing physical education courses, training physical education teachers, and building a fitness campus. University physical education courses can directly guide students to develop a fitness lifestyle and improve their physical fitness. Scholars suggest changing teaching and evaluation methods, choosing suitable programs, encouraging students to actively participate, and creating a fitness atmosphere.

For developing strategies to promote physical fitness among university students. There are 6 aspects for developing strategies as follows: (1) Policy and Administrative Support; (2) Physical Education Curriculum and Programs; (3) Facilities and Equipment; (4) Engagement and Motivation; (5) Monitoring and Assessment; and (6) Sustainability of Fitness Programs. Each aspect focuses on critical areas essential for fostering and maintaining a culture of fitness within the university environment. By addressing these 6 key aspects, the university can implement a comprehensive and sustainable strategy to promote physical fitness, improving their overall health, well-being, and academic success.

Conceptual Framework

The research title “Developing Strategies to Promote Physical Fitness for University Students” was designed as follows.

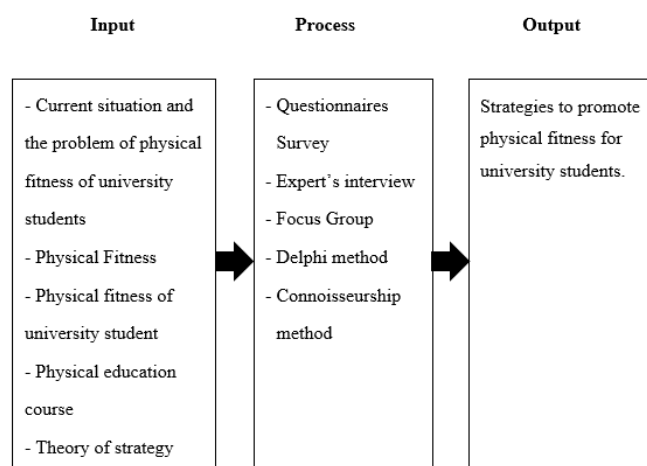


Figure 1 Conceptual framework



Methodology

Population: The population of this research consists of 5,275 first-year students enrolled at the Guangdong University of Foreign Studies for the academic year 2023.

Sample: The sample size was determined using the Taro-Yamane formula with 5%. Then, the required sample size can be calculated according to the formula. After calculating the above formula, the required sample size can be calculated as 371 students. Finally, the sample of this research is 371 students.

Research Participation

Expert for IOC

5 experts were selected through purposive sampling, including 3 physical education teachers, and 2 physical fitness experts. The experts were invited to evaluate the questionnaire for university students and the expert's interview form using the Index of Item-Objective Congruence (IOC) method.

Expert for Experts' interview

7 experts were selected through purposive sampling, including 2 university leaders, 3 physical education teachers, and 2 physical fitness experts. These experts were invited to participate in expert interviews to study and gather more information about the current situation and challenges related to physical fitness among university students.

Expert for Focus group

10 experts were selected through purposive sampling, including 3 university leaders, 4 physical education teachers, and 3 physical fitness experts. These experts were invited to participate in a focus group to develop the question framework for use in Delphi consensus.

Expert for Delphi method

19 experts were selected through purposive sampling, including 5 university leaders, 5 physical education teachers, 5 physical fitness experts, and 4 educational psychology experts. All experts have a minimum of 5 years of work experience and hold at least a master's degree. These experts were invited to conduct a two-round Delphi consensus. The objective is to develop strategies to promote physical fitness for university students.

Expert in Connoisseurship method

9 experts were selected through purposive sampling, including 2 university leaders, 3 physical education teachers, 2 physical fitness experts, and 2 educational psychology experts. These experts were invited to conduct a connoisseurship panel to discuss and confirm the strategies to promote physical fitness for university students.

Research Instruments

1. Questionnaires for university students: The questionnaire for university students was developed by reviewing relevant articles and research. After the questionnaire was created, it was reviewed by five experts to evaluate the alignment of the questions with the research objectives using the Index of Item-Objective Congruence (IOC).

2. Interview form for expert: An expert interview form will be prepared for the expert interviews, designed to gather insights into the current state and challenges of university students' physical fitness. The information collected will also be used to develop a question framework for focus group discussions.

3. Focus Group Outline: A focus group outline will be prepared for the focus group discussion. The information collected will also be used to develop the question framework for use in the Delphi consensus.

4. Questionnaire for Delphi: Based on the focus group discussion, the experts will develop a questionnaire to be used in the Delphi consensus process. The Delphi questionnaire aims to evaluate the components of strategies to promote physical fitness for university students. Once the questionnaire is created, it will be reviewed by 5 experts to assess the

alignment of the questions with the research objectives using the Index of Item-Objective Congruence (IOC).

5. Evaluation form for Connoisseurship : After two rounds of Delphi consensus, the researcher will develop an evaluation form for Connoisseurship. This form will be used to confirm and assess the effectiveness of the developed strategies to promote physical fitness for university students.

Data collection

1. A questionnaire for university students was drafted to investigate the current situation and problems related to their physical fitness. Subsequently, 5 experts evaluated the questionnaire to ensure its alignment with the objectives using the Item-Objective Congruence (IOC) method.

2. The questionnaires will be distributed to all 371 university students through on-site distribution to study the current situation and problems related to their physical fitness.

3. Draft the questions for the expert interviews and have them evaluated by 5 experts to evaluate their alignment with the objectives using the Item-Objective Congruence (IOC) method.

4. 7 experts including 2 university leaders, 3 physical education teachers, and 2 physical fitness experts were invited to conduct face-to-face interviews, to study and gather more information about the current situation and challenges related to physical fitness among university students, and create a question framework for the focus group, focusing on essential components of the strategies to promote physical fitness for university students.

5. 10 experts including 3 university leaders, 4 physical education teachers, and 3 physical fitness experts were invited to conduct a focus group discussion to develop the question framework for use in Delphi consensus.

6. Draft the questions for Delphi and have them evaluated by 5 experts to evaluate their alignment with the objectives using the Item-Objective Congruence (IOC) method.

7. 19 experts including 5 university leaders, 5 physical education teachers, 5 physical fitness experts, and 4 educational psychology experts were invited to conduct a two-round Delphi consensus, aiming to develop strategies to promote physical fitness for university students. Questionnaires for Delphi were distributed to 19 experts in the form of on-site and online distribution.

8. Draft evaluation form for Connoisseurship to confirm the appropriateness of the implementation of the developed strategies to promote physical fitness for university students

9. 9 experts including 2 university leaders, 3 physical education teachers, 2 physical fitness experts, and 2 educational psychology experts were invited to conduct a connoisseurship panel to confirm the developed strategies to promote physical fitness for university students.

Data analysis

This study primarily utilized a software package for data analysis.

1. Descriptive statistical techniques, including the calculation of mean and standard deviation, were applied to analyze the data collected from the questionnaire for university students and the evaluation form for connoisseurship.

2. Evaluate the content validity of the questionnaire for university students the expert interview form, and the evaluation form for connoisseurship, using the Index of Item-Objective Congruence (IOC). The IOC value for the questionnaire for university students was 0.90, the IOC value for the expert interview form was 0.86, and the IOC value for the questionnaire for Delphi was 0.89.

3. The expert interviews and focus group discussions were analyzed using content analysis.



4. Descriptive statistics, including the median and interquartile range, were used to analyze the Delphi consensus data. The analysis criteria were a median of ≥ 3.50 and an interquartile range of ≤ 1.50 .

5. The researcher utilized the Likert scale to evaluate the data provided by experts, calculating the average score for each measure based on their input.

Results

The survey was distributed to 371 first-year students enrolled at the Guangdong University of Foreign Studies for the 2023 academic year. All 371 students completed the questionnaires. The collected data will be analyzed to offer insights into the current physical fitness situation and related issues among university students. The results of this analysis are presented as follows:

Table 1 The result of questionnaires for university students on the current situation and problems of the physical fitness of university students.

Questionnaire Items	Total Score		Result
	\bar{x}	S.D.	
1. Have you received any education or training in physical fitness before attending university?	2.90	0.54	Moderate
2. Do you believe that maintaining physical fitness is important for your overall well-being?	4.50	0.60	Highest
3. How often do you engage in physical activities?	2.40	0.49	Poor
4. Do you participate in any organized physical activities (e.g., sports clubs, gym classes)?	2.30	0.46	Poor
5. Do you have challenges and problems which prevent you from participating in regular physical activity?	3.90	0.70	High
6. Do you think the university provides sufficient support to improve your physical fitness	2.40	0.49	Poor
7. How do you feel about the frequency of physical education courses offered at your university?	3.00	0.45	Moderate
8. How would you describe your current physical fitness level?	2.12	1.43	Poor
9. Have you experienced any health issues or injuries that affect your physical activity?	2.80	0.60	Moderate
10. Would you like to receive more guidance or training on how to improve your physical fitness?	4.34	0.72	Highest
11. How confident are you in maintaining your physical fitness throughout your university years?	2.30	0.46	Poor
12. How would you rate the effectiveness of the university's current strategy for physical fitness?	3.00	0.45	Moderate
13. Do you think the university needs to develop a strategy for improving physical fitness?	4.70	0.64	Highest

From Table 1 The result of questionnaires for university students on the current situation and problems of the physical fitness of university students, showed that university students still need to improve their physical fitness, this can be seen from question 8 “How would you describe your current physical fitness level?”, the result of this question was in the “Poor” ($\bar{x} = 2.12$). University student believed that maintaining good physical fitness affects their overall health, this can be seen from question 1 “Do you believe that maintaining physical fitness is

important for your overall well-being?”, the result of this question was in the “Highest” ($\bar{x} = 4.50$). However, university students don’t have the confidence to maintain their physical fitness, this can be seen from question 11 “How confident are you in maintaining your physical fitness throughout your university years?”, the result of this question was “Poor” ($\bar{x} = 2.30$). Therefore, university students need to receive more guidance or training on how to improve their physical fitness, this can be seen from question 10 “Would you like to receive more guidance or training on how to improve your physical fitness?”, the result of this question was in the “Highest” ($\bar{x} = 4.34$), this showed that university students still lack someone to guide or advise them on how to develop their physical fitness.

In terms of participation in sports activities. University students still participate in sports activities at a low level. There is a lack of participation in sports activities, this can be seen from question 3 “How often do you engage in physical activities?”, the result of this question was in the “Poor” ($\bar{x} = 2.40$), and question 4 “Do you participate in any organized physical activities (e.g., sports clubs, gym classes)?”, the result of this question was in the “Poor” ($\bar{x} = 2.30$). Several factors cause university students to have low participation in sports activities, this can be seen from question 5 “Do you have challenges and problems which prevent you from participating in regular physical activity?”, the result of this question was in the “High” ($\bar{x} = 3.90$).

In terms of supporting sports activities and promoting the development of physical fitness of university students. University students think that university support in developing physical fitness is insufficient, this can be seen from question 6 “Do you think the university provides sufficient support to improve your physical fitness”, the result of this question was the “Poor” ($\bar{x} = 2.40$), and question 12 “How would you rate the effectiveness of university’s current strategy about physical fitness?”, the result of this question was in the “Moderate” ($\bar{x} = 3.00$). Therefore, university students think that the university must develop an effective strategy for improving their physical fitness, this can be seen from question 13 “Do you think the university needs to develop a strategy for improving physical fitness?”, the result of this question was in the “Highest” ($\bar{x} = 4.70$).

1. Develop the framework of a questionnaire for Delphi by focus group discussion.

A focus group of 10 experts including 3 university leaders, 4 physical education teachers, and 3 physical fitness experts was conducted to develop the question framework for use in Delphi consensus. In this process, the discussion contents were analyzed by using content analysis.

Through focus group discussion with 10 experts, we can summarize the following key suggestions and strategies:

1. Optimize physical education courses: The courses should be combined with students' major and life, set up diversified contents, and keep scientific and practical. Increase the number of physical education courses, diversify the curriculum setting, improve the quality of physical education courses, carry out personalized teaching, physical education courses and academic year, subject combination, etc. Provide a variety of sports to increase the diversity of sports to stimulate students' interest and participation.

2. Additional physical fitness test: systematic evaluation and intervention, regular physical fitness test, and targeted exercise intervention and fitness for guidance based on the test results.

3. Self-motivation: create a good sports culture environment: strengthen the construction of sports culture, encourage students to actively participate in sports activities, and improve the overall sports atmosphere. Strengthening fitness for management and education: establish a systematic fitness for management platform, provide personalized fitness for advice, and integrate fitness for education into students' daily lives.



4. fitness management: Provide more opportunities for extracurricular sports activities, such as sports meetings and sports clubs, to improve student participation. Enhance fitness awareness, and improve students' fitness awareness and participation enthusiasm through innovative fitness education methods. Moreover, it also provides cross-departmental cooperation, carries out extracurricular sports activities, enriches campus sports culture, organizes student sports community, improves sports venues and facilities, provides fitness diet guidance, releases sports fitness for knowledge, strengthens mental fitness for education, and home-school coalition.

2. Drafting the strategies to promote physical fitness for university students.

Incorporating insights and recommendations from Delphi experts, including 5 university leaders, 5 physical education teachers, 5 physical fitness experts, and 4 university management authorities, we can outline the strategies to promote physical fitness for university students as follows:

Table 2 The strategies to promote physical fitness for university students.

No.	Strategies to promote physical fitness for university students		
1.	Policy and Administrative Support	University Policy	1. Integrating physical fitness programs into university policies and strategic plans
			2. Establishing Fitness Goals for the University (e.g., improving average fitness levels or reducing health-related issues)
			3. Creating a Task Force or Committee. The university has to create a dedicated task force or committee responsible for developing, implementing, and monitoring physical fitness programs and policies
	Leadership Support		1. Gaining commitment and support from university leadership for physical fitness initiatives
			2. Collaboration with Health and Fitness Experts, as it brings professional knowledge, expertise, and practical approaches to address students' fitness needs.
			3. Support awareness campaigns for student health and fitness. Effective campaigns can drive engagement, raise awareness, and encourage healthier lifestyle choices.
	Allocating Resources		4. Encourage staff and faculty to promote physical fitness and actively participate in campus fitness activities.
			1. Ensuring adequate financial, human, and physical resources for physical fitness programs.
			2. Allocate resources and budget for fitness initiatives. Clearly outline the goals of fitness initiatives and identify and estimate costs for all aspects of fitness initiatives
			3. Provide more funding for fitness programs
	Physical Education Curriculum	Curriculum Integration	1. Including physical fitness as part of the mandatory academic curriculum. Promoting the integration of physical fitness elements (e.g., movement breaks,



No.		Strategies to promote physical fitness for university students	
and Programs		fitness education, etc.) into non-physical education courses such as health, biology, and general wellness courses	
		2. Practical Fitness Modules. Including practical fitness modules as part of various academic programs, ensuring students gain both theoretical and practical knowledge about physical health	
		3. Increase time spent on extracurricular activities to promote physical fitness. Encourage students to spend their free time after school on activities to enhance their physical fitness by setting a time limit for each activity per week.	
		Program Diversity	
		1. Offering a variety of fitness programs (e.g., aerobics, strength training, yoga) to cater to different student preferences	
		2. Customizable Fitness Plans. Providing customizable fitness plans or options that allow students to tailor their fitness routines according to their personal goals and preferences	
		3. Inclusion of Non-Traditional Fitness Activities. Including non-traditional or emerging fitness activities (e.g., rock climbing, martial arts, or mindfulness exercises) to attract students who may not engage with conventional fitness programs.	
		4. Student Feedback Integration. Incorporating student feedback into the development and adjustment of fitness programs to better meet their needs and preferences	
		Regular Fitness Classes	
		1. Providing regular physical education classes that focus on fitness training and health education	
		2. Variety of Class Options. Providing a range of fitness classes at different times and days to accommodate various student schedules and preferences.	
		3. Class Size and Student Engagement. Managing class sizes to ensure adequate instructor attention and maximize student engagement and participation.	
3.	Facilities and Equipment	Access to Fitness Facilities	1. Ensuring all students have access to fitness facilities such as gyms, tracks, and sports fields.
			2. Facility Location. Providing convenient locations for fitness facilities within easy reach of student housing and academic buildings.
			3. Membership and Fees. Offering affordable or subsidized membership fees for students to encourage regular use of fitness facilities.
		Upgrading Facilities	1. Upgrading fitness equipment and facilities to encourage student participation.



No.	Strategies to promote physical fitness for university students		
			2. Ensuring that fitness facilities are well-equipped with a variety of exercise machines, free weights, and other fitness resources.
			3. Maintenance and Cleanliness. Maintaining high standards of cleanliness and regular maintenance of fitness facilities to ensure a safe and pleasant environment.
			4. Availability of Support Services. Providing additional support services such as fitness assessments, personal training, and wellness programs within the fitness facilities.
		Scheduling Access	1. Providing flexible facility hours to accommodate different student schedules. Ensuring that fitness facilities are available during hours that accommodate students' schedules, including evenings and weekends
4.	Engagement and Motivation	Student Participation Incentives	1. Offering incentives such as academic credits, certificates, or awards to motivate students to engage in physical fitness activities
			2. Financial Incentives. Offering financial incentives such as scholarships or cash prizes for consistent participation or improvement in physical fitness.
			3. Access to Exclusive Resources. Providing access to exclusive resources such as advanced fitness equipment, workshops, or events for participants who meet certain fitness goals.
		Fitness Challenges and Competitions	4. Social Recognition. Implementing social recognition systems, such as featuring participants in newsletters or social media, to acknowledge their commitment to physical fitness.
			Organizing fitness challenges or competitions to increase student engagement in fitness activities
			1. Running awareness campaigns to promote the importance of physical fitness and a healthy lifestyle
		Promoting a Healthy Lifestyle	2. Mental Health Support. Providing support for mental health, such as counseling services and stress relief activities, as part of a holistic approach to a healthy lifestyle
			3. Regular Physical Activity Encouragement. Encouraging regular physical activity through campaigns, fitness challenges, and integrating exercise into daily routines.
5.		Fitness Assessment	1. Implementing regular fitness assessments to monitor student progress and provide feedback.



Strategies to promote physical fitness for university students		
No.	Monitoring and Assessment	2. Integration of Fitness Assessment into Curriculum. Incorporating fitness assessments as a part of the physical education curriculum to ensure students regularly monitor their fitness levels.
	Data Collection on Fitness Levels	1. Collecting and analyzing data on student fitness levels to inform policy and curriculum decisions 2. Use of Fitness Assessment Data for Program Improvement. Utilizing data from fitness assessments to make informed decisions about program adjustments and enhancements to better meet students' needs.
	Personalized Fitness Plans	1. Offering personalized fitness plans for students based on their fitness assessments 2. Personalized Fitness Feedback. Providing individualized feedback based on fitness assessment results to help students understand their strengths and areas for improvement.
6.	Sustainability of Fitness Programs	Long-term Strategy
		1. Developing long-term strategies to ensure the sustainability of physical fitness programs.
		2. Ongoing Student Engagement Initiatives. Implementing initiatives that continuously engage students in physical fitness activities and maintain their interest throughout their university years.
		3. Long-term Goal Setting and Tracking. Encouraging students to set long-term fitness goals and track their progress to support sustained commitment to physical fitness.
		4. Faculty and Staff Involvement. Engaging faculty and staff in promoting and supporting physical fitness initiatives to create a campus-wide culture of health and fitness.
		Collaboration with External Organizations
		1. Collaborating with local fitness centers or sports organizations to provide additional fitness opportunities for students 2. Collaboration with Community Health Programs. Partnering with community health programs to integrate university students into broader health initiatives and outreach programs. 3. Support from Fitness Industry Sponsors. Seeking sponsorship from fitness industry companies to support fitness programs and provide resources or incentives for students.
		Engaging Alumni
		1. Involving alumni in fitness activities or programs as mentors or sponsors 2. Alumni Fitness Challenges. Creating fitness challenges or competitions involving both alumni





No.	Strategies to promote physical fitness for university students
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and current students to foster engagement and motivation.

As shown in Table 2, the developed strategies to promote physical fitness for university students were divided into 6 key aspects and consisted of 51 factors. 6 key aspects of the development strategies were as follows: (1) Policy and Administrative Support; (2) Physical Education Curriculum and Programs; (3) Facilities and Equipment; (4) Engagement and Motivation; (5) Monitoring and Assessment; (6) Sustainability of Fitness Programs. Each aspect addresses specific areas critical to fostering and maintaining a fitness culture within a university setting.

1. Policy and Administrative Support. The university should integrate physical fitness into its core policies, making it a priority within the overall educational mission. Senior university leaders and administrators should provide visible support for fitness initiatives, ensuring the allocation of adequate resources and guidance for implementation. Implement university-wide policies that mandate regular physical education courses and activities, ensuring consistent student participation in fitness programs.

2. Physical Education Curriculum and Programs. Embed physical fitness and wellness concepts into the broader academic curriculum to promote an understanding of the importance of fitness across all disciplines. Offer a variety of physical education programs, including traditional sports, recreational activities, and individual fitness options, to accommodate different student preferences. Increase time spent on extracurricular activities to promote physical fitness. Schedule regular fitness and physical education classes that are integrated into students' weekly routines, ensuring continuous physical activity throughout the academic year.

3. Facilities and Equipment. Ensure that all students have access to modern, well-equipped fitness facilities, including gyms, sports fields, and other recreational areas. Extend the hours of operation for fitness centers and recreational spaces to allow students to engage in physical activities at times that suit their schedules.

4. Engagement and Motivation. Develop programs that provide incentives for students who participate regularly in physical fitness activities, such as awards, recognition, or academic credit. Run campaigns to raise awareness about the benefits of physical fitness, healthy eating, and mental wellness, encouraging students to adopt healthier lifestyles.

5. Monitoring and Assessment. Implement systems for assessing students' fitness levels regularly, helping students track their progress and motivating them to improve. Provide feedback on individual fitness assessments and offer personalized guidance to help students address areas of improvement.

6. Sustainability of Fitness Programs. Develop a long-term fitness strategy that ensures the continuity and growth of fitness programs, including securing funding and resources for future initiatives. Partner with external fitness experts, alumni, and community organizations to enhance program offerings and ensure the sustainability of fitness initiatives.

3. Confirmation of the developed strategies to promote physical fitness for university students, by using the Connoisseurship method

The researcher has summarized their opinions and evaluation results on the developed strategies to promote physical fitness for university students. All 9 experts agree that the development strategies to promote physical fitness for university students comprise appropriate and high-quality content. The strategies to promote physical fitness for university students are deemed suitable for implementation, with a clear focus on sustainability, engagement, and long-term success.

4. Summary





Through questionnaire surveys, expert interviews, focus group discussions, and two rounds of Delphi consensus, the strategies to promote physical fitness for university students were organized into 6 key aspects and comprised 51 factors. These 6 key aspects include: (1) Policy and Administrative Support, (2) Physical Education Curriculum and Programs, (3) Facilities and Equipment, (4) Engagement and Motivation, (5) Monitoring and Assessment, and (6) Sustainability of Fitness Programs. Finally, the strategies to promote physical fitness for university students were reviewed and validated for their applicability by experts through the Connoisseurship process. All 9 experts agreed that the content was appropriate and that the university could implement these strategies to enhance physical fitness for university students.

Discussion

1. **Policy and Administrative Support:** One of the most significant findings from this research is the importance of institutional policy and administrative support in promoting physical fitness. The role of university leadership is crucial in creating an environment where physical fitness is valued as part of the student experience. This is consistent with the research result of Elliott & Grunseit (2019) which indicated the influence of university-level policies on student physical health, showing that institutions that prioritize physical activity through formal policies report higher levels of student fitness.

2. **Physical Education Curriculum and Programs:** A well-rounded physical education curriculum that incorporates diverse programs tailored to students' interests and abilities was identified as a key component. A variety of physical activities, from traditional sports to modern fitness trends, ensures that students remain engaged and motivated. The inclusion of regular fitness classes was highlighted as a strategy to ensure continuous physical activity. Furthermore, integrating fitness into the overall curriculum, as part of general education requirements, can increase participation and emphasize its importance for students' academic success and long-term health. This is consistent with the research result of Sallis (2012) in their systematic review, noted that universities offering a wide range of physical education programs, which incorporate both traditional sports and modern fitness trends, are more successful in keeping students engaged in physical activity.

3. **Facilities and Equipment:** Access to appropriate fitness facilities and equipment was another critical factor. The research shows that the availability of fitness centers, open spaces for physical activities, and well-maintained equipment significantly impacts student participation. This is consistent with the research result of Coulson et al. (2008) explored how fitness equipment and facilities at universities impact student fitness levels.

4. **Engagement and Motivation:** Student engagement and motivation are crucial for the success of fitness promotion strategies. The research highlights the need to create incentives for students to participate in physical activities. These incentives could include rewards for consistent participation, recognition for physical achievements, or even academic credits for involvement in fitness programs. Experts also suggested incorporating peer support groups and fitness challenges to foster a community of active participants, making physical fitness a social as well as personal goal. This is consistent with the research result of Schaufeli and Bakker (2004) this research explores the Job Demands-Resources (JD-R) model and its impact on employee engagement and burnout.

5. **Monitoring and Assessment:** The ability to monitor student progress and assess the effectiveness of fitness programs was another key theme in the research. Regular fitness assessments provide feedback to both students and administrators about fitness levels, improvements, and areas needing attention. This information can help tailor fitness programs to individual needs and ensure that strategies are achieving the desired outcomes. This is



consistent with the research result of Bennett and Doughty (2007) explore methods and best practices for monitoring and evaluating educational programs.

Recommendations

Recommendation for this research

1. Include research on how to motivate university students to consistently engage in fitness activities. This can involve exploring reward-based systems, gamification, and social support mechanisms to increase participation rates.
2. Identify common barriers that prevent students from engaging in physical fitness activities, such as lack of time, awareness, or facilities. Research solutions for overcoming these barriers, including flexible scheduling, increased communication, and affordable programs.

Recommendation for further research

1. Develop methods to assess the long-term effectiveness of the implemented strategies. Consider tracking fitness improvements, student satisfaction, and participation levels over several semesters or academic years.
2. Assess the current fitness facilities and resources on campus and make recommendations for improvements that support increased participation. Developing outdoor exercise spaces, investing in modern equipment, or expanding access to fitness centers could enhance the overall fitness environment.

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