

Assessment of the determinants affecting the promotion of physical activity among university students in Saudi Arabia

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Abstract

Background and Study Aim Promoting physical activity among students is essential for enhancing their overall health and well-being. Several factors influence how physical activity programs are designed and implemented in this context. The purpose of this study was to assess the determinants affecting the promotion of physical activity among university students in Saudi Arabia.

Material and Methods A cross-sectional study was conducted with 670 participants. The age range was 18–30 years. A questionnaire was developed to determine the determinants affecting the promotion of physical activity among university students. The questionnaire consisted of 15 determinants that influence the promotion of physical activity. There were five response categories, e.g., 1 = strongly disagree to 5 = strongly agree. Data were collected online.

Results There were nine statements that showed significant differences between determinants identified by male and female students. Female students were more interested than males in the “autonomy of students in physical activities,” “innovative curriculum,” “teacher’s motivation for students’ engagement,” “teaching strategies in physical activity sessions,” and “use of digital technologies in Physical Education.” The following five determinants were found to have the most effect on the promotion of physical activity in Saudi Arabia: qualified and experienced teachers, good student-teacher relationships, a good physical activity environment, fun in physical activities, and good facilities and equipment for physical activities.

Conclusions To effectively promote physical activity among students, it is crucial to develop strategies that are culturally appropriate, supported by accessible resources, and incorporate motivational tools that resonate with the student population. Implementing and evaluating such tailored interventions can lead to sustainable improvements in physical activity behaviors among Saudi students.

Keywords: physical activity, physical exercise, promotion, university students, gender differences

Introduction

Physical activity is vital for maintaining health and well-being, especially among university students who often experience high academic pressure and limited opportunities for exercise. To encourage an active lifestyle in this group, it is important to examine the factors that influence their participation in physical activity. Promoting physical activity among university students is crucial for their overall health and well-being [1]. Effective promotion of physical activity (PA) requires a comprehensive approach that addresses individual motivations, leverages social support systems, enhances organizational infrastructure, and cultivates a conducive environment. In Saudi Arabia, as in many other Gulf Cooperation Council countries, levels of PA among young people remain notably low, leading to increased health concerns

such as obesity, cardiovascular diseases, and declining mental health [2]. Engaging in regular physical activity has been shown to enhance sleep quality, boost physical fitness, and reduce symptoms of depression and stress among university students [3]. However, despite its well-documented benefits, participation in PA remains low among Saudi university students due to various socio-cultural, institutional, and motivational barriers [4].

While extensive literature explores the benefits of PA, limited research has examined the specific determinants influencing its promotion within Saudi universities. Previous studies have largely focused on PA trends among school-aged children or the general population, with little attention given to university students, who face unique academic and social pressures that affect their engagement in PA [5]. Additionally, research exploring gender-specific determinants within Saudi universities remains scarce. Given the socio-cultural context

and the varying opportunities available to male and female students, understanding these differences is essential for designing effective PA interventions.

Self-Determination Theory (SDT) [6] and the Social-Ecological Model (SEM) [7] provide valuable frameworks for understanding the factors influencing participation in PA. SDT explains how autonomy, competence, and relatedness shape an individual's motivation to engage in PA, while SEM highlights the interplay between individual, social, institutional, and environmental factors in shaping PA behaviors.

A review of existing research has shown that motivational, social, and institutional factors influence PA participation among university students. Despite extensive studies on PA engagement, there is still a need for further research on the specific determinants that affect its promotion.

Therefore, the purpose of this study was to assess the determinants affecting the promotion of physical activity among university students in Saudi Arabia.

Materials and Methods

Participants

Participants in this study were male and female Saudi university students. Due to time, expense, and accessibility constraints, it was decided to concentrate on one region, specifically the Eastern Region of the Kingdom. There are five universities in this region. The researcher targeted students from these universities. Participants were recruited on a voluntary basis. Two methods were used for participant recruitment. First, the PE department in each university was approached to obtain written informed consent from participants. Second, different community leaders were contacted to encourage students to participate. The sampling method was convenience sampling, as participants were selected based on their accessibility and availability to the researcher [8]. The questionnaires were administered online (through Google Forms) so that students could complete them at their convenience. A total of 670 participants (52.80% male and 47.20% female) were included in this study from five different universities. More than 90% of participants were young students between 18 and 25 years old. Only 6.40% were between 26 and 30 years old. Only students who were currently enrolled in a university participated in this study.

Research Design

A cross-sectional study was carried out to achieve the aims of this investigation. A cross-sectional design was chosen as it efficiently captures PA determinants among Saudi university students at a single point in time, making it cost-effective and time-efficient.

Study Settings. This investigation was conducted at

five universities in Saudi Arabia from January 2022 to September 2023: King Fahd University of Petroleum and Minerals (KFUPM), Prince Mohammed Bin Fahd University (PMU), Imam Abdulrahman Bin Faisal University (IAU), King Faisal University (KFU), and the University of Hafr Al-Batin (UHB).

Ethical Consideration. The data-collection instruments were designed to meet ethical standards, which included obtaining necessary approvals and safeguarding individuals from harm, deception, and invasion of privacy. Participants' dignity and interests were always maintained. The physical education department in various universities was approached to obtain consent from participants. The purpose, procedures, and possible outcomes of the study were described in the consent letter. All participants were informed about the publication of results in suitable venues, and confidentiality of participants and organizations was maintained.

This study is part of a PhD research project at Universiti Teknologi Malaysia (UTM) and did not require formal ethics committee approval. It fully complies with the Declaration of Helsinki and underwent a rigorous proposal defense and viva voce to ensure ethical integrity. As the research involved non-invasive methods, it did not fall under UTM's requirements for formal ethical approval, but all ethical standards were upheld.

Sample Size Calculation. Cochran's Sample Size Formula was used to calculate the sample size, using a confidence level of 95% and a margin of error of 5%. Based on university records, the target population was estimated at approximately 10,000 students, leading to a required sample size of 654 responses for this study.

Tool. A questionnaire was developed in consultation with five experts in the fields of physical education, sports sciences, and community medicine, as well as based on a literature review. This questionnaire was designed to gather the viewpoints of Saudi university students on the determinants that might affect the promotion of physical activity. A final set of 15 determinant categories, identified through a previously conducted systematic literature review, was used in the questionnaire design [9]. The questionnaire aimed to collect data on which factors (e.g., qualified and experienced teachers, innovative curriculum, fun in PA, etc.) influence the promotion of physical activity among male and female university students in Saudi Arabia. Likert scales were used in this questionnaire, with five response categories, ranging from 1 = strongly disagree to 5 = strongly agree.

Questionnaire Validation. The Cronbach's alpha test was performed to assess the reliability of the questionnaire [10]. Cronbach's alpha is a statistical measure used to evaluate internal consistency. Responses from twenty university students in a pilot study were used for this reliability analysis.

The Cronbach's alpha coefficient was 0.871, which is considered acceptable for this research.

Procedure. The data were collected online. A questionnaire developed to investigate the determinants of physical activity promotion among Saudi students, along with a demographic questionnaire, was created using Google Forms. Through social media and university emails, the questionnaire link was disseminated among university students. Participants were recruited on a voluntary basis, and they provided their consent for participation in this study. This questionnaire was divided into two sections. The first section collected demographic data, and most of the questions were closed-ended, gathering information about gender, age, degree, etc. The second section focused on the determinants of physical activity promotion among Saudi students. The collected data were analyzed using a quantitative approach. This approach was used to examine the results of the questionnaire survey, such as identifying relationships among determinants, counting their frequency to indicate relative importance, and determining which determinants are most relevant in influencing physical activity promotion among university students in Saudi Arabia. The collected data were transferred from Microsoft Excel to SPSS software for further analysis. Nine questions were included in the demographic section of the questionnaire. These questions addressed age, ethnicity, gender, class standing, major, marital status, sports skills, perceived PE quality, and university name.

Statistical Analysis

The IBM Statistical Package for the Social Sciences (IBM SPSS) version 26 for Windows was used for descriptive and inferential statistics. Descriptive statistics included frequency, percentage, mean, and standard deviation. Inferential statistical analysis included Fisher's exact test, which was used to determine the differences between male and female responses to the determinants of promoting physical activity among Saudi students. Fisher's exact test was chosen for gender comparisons because it is particularly suited for analyzing categorical data when dealing with small sample sizes or uneven group distributions [11]. This test ensures an accurate assessment of statistical significance when comparing male and female students' responses to different PA determinants. Differences between universities were determined using one-way Analysis of Variance (ANOVA). The level of statistical significance was set at $p < 0.05$.

Results

More than 90% of participants were young students between 18 and 25 years old. Only 6.40% were between 26 and 30 years old. Additionally, 2.70% of the participants were mature-aged

students. Most of the participants were Saudi (85.40%). There were also participants from other nationalities, such as Asian (8.50%) and African (4.65%). The sample was almost evenly distributed between male (52.80%) and female (47.20%) participants. Most participants were undergraduate students, with only 8.1% pursuing MSc or PhD degrees. When asked about their field of study, the results showed that participants were enrolled in various disciplines, including engineering, computer science, natural sciences, and social sciences. Most participants were single (94.50%), with only 5.1% being married. The participants were from five universities in the Eastern Province of Saudi Arabia. The sample distribution was as follows:

- King Fahd University of Petroleum and Minerals (KFUPM) – 22.70%;
- Prince Mohammed Bin Fahd University (PMU) – 26.60%;
- Imam Abdulrahman Bin Faisal University (IAU) – 15.10%;
- King Faisal University (KFU) – 21.20%;
- University of Hafr Al-Batin (UHB) – 14.50%.

It is noteworthy that only 10.6% of the participants reported having no sports skills. In contrast, the majority had training in different sports, such as soccer, basketball, volleyball, badminton, and weight training.

Table 1 provides a comprehensive overview of the key determinants influencing the promotion of physical activity among Saudi university students. The most significant determinant that favorably affects PA promotion is "Qualified and experienced teachers," with a percentage of 78.51. The percentage of "Good student-teacher relationships" was identified at 76.72, highlighting the importance of mentorship and encouragement in motivating students to participate in physical activities. The third most frequently cited determinant is "Supportive physical activity environment," with a percentage of 76.42, indicating that students are more likely to engage in PA when the environment is welcoming. "Fun in physical activities" is the fourth most critical determinant, with a percentage of 75.22. The fifth most critical determinant is "High-quality facilities and equipment for physical activities," as high-quality resources enhance participation and sustain student interest in PA. The remaining determinants also play an essential role in promoting physical activity, though their impact varies in frequency. These findings suggest that improving the quality of instructors, interpersonal support, infrastructure, and the enjoyment factor can significantly contribute to higher engagement in PA among university students, shaping institutional strategies for PA promotion.

Table 2 shows that nine statements demonstrated significant differences (i.e., $p < 0.05$) between determinants identified by male and

Table 1. Descriptive analysis of overall statements for promoting physical activity

Determinants	Occurrence in the survey (n=670)							
	Positive			Negative			Neutral	
	SA	A	%	D	SD	%	N	%
Students' autonomy in physical activities	163	238	59.85	46	17	9.40	206	30.75
Design of competitive physical activity programs	130	272	60.00	48	25	10.90	195	29.10
Fitness promotion initiatives at the university	166	247	61.64	60	19	11.79	178	26.57
Fun in physical activities	274	230	75.22	34	17	7.61	115	17.16
High-quality facilities and equipment for physical activities	285	213	74.33	39	26	9.70	107	15.97
Supportive physical activity environment	278	234	76.42	29	21	7.46	108	16.12
Strong student-teacher relationships	282	232	76.72	16	15	4.63	125	18.66
Innovative curriculum	165	210	55.97	68	31	14.78	196	29.25
Qualified and experienced teachers	241	285	78.51	20	12	4.78	112	16.72
Regular physical activity programs	151	249	59.70	58	19	11.49	193	28.81
Small class sizes	100	142	36.12	134	45	26.72	249	37.16
Teachers' motivation for student engagement	206	248	67.76	47	32	11.79	137	20.45
Effective teaching strategies in physical activity sessions	157	247	60.30	47	31	11.64	188	28.06
Encouraging teamwork	162	241	60.15	58	21	11.79	188	28.06
Integration of digital technologies in Physical Education	129	183	46.57	94	49	14.03	215	32.09

Table 2. Comparative analysis between gender for the questionnaire surveys

Determinants	Male (n=354)					Female (n= 316)					$\alpha = 0.05$
	Positive %		Negative %		Nutr %	Positive %		Negative %		Nutr %	
	SA	A	D	SD	N	SA	A	D	SD	N	
Students' autonomy in physical activities	21	33	8	4	35	28	38	6	1	27	.014
Design of competitive physical activity programs	19	42	7	5	28	20	39	8	3	31	.398
Fitness promotion initiatives at the university	21	35	11	4	29	29	39	7	1	24	.011
Fun in physical activities	41	35	5	4	15	42	33	8	1	20	.020
High-quality facilities and equipment for physical activities	43	30	8	6	13	42	34	6	2	19	.001
Supportive physical activity environment	40	36	4	5	15	43	34	5	1	18	.021
Strong student-teacher relationships	40	33	3	3	22	45	37	2	2	15	.076
Innovative curriculum	18	29	13	7	33	32	34	7	3	25	.000
Qualified and experienced teachers	32	44	4	2	18	40	41	2	2	15	.229
Regular physical activity programs	22	37	9	3	30	24	38	8	3	28	.913
Small class sizes	14	19	23	7	37	17	23	17	7	37	.191
Teachers' motivation for student engagement	27	38	9	6	20	35	35	5	4	21	.021
Effective teaching strategies in physical activity sessions	19	36	8	7	30	29	37	6	3	26	.006
Encouraging teamwork	22	40	8	4	27	27	32	10	2	29	.136
Integration of digital technologies in Physical Education	13	26	20	12	29	26	29	8	2	35	.000

female students. Hence, there is enough evidence that specific determinants are more frequently associated with either male or female students. This indicates that male and female students do not share a consensus, and there are differences in the determinants between them in the Eastern Province of Saudi Arabia. The results in Table 2 can be used to design effective physical education (PE) programs to engage both male and female students in physical activities. For example, female students showed greater interest than males in “Students’ autonomy in physical activities,” “Innovative curriculum,” “Teachers’ motivation for student engagement,” “Effective teaching strategies in physical activity sessions,” and “Integration of digital technologies in Physical Education.” Similarly, male students were more interested than females in “Design of competitive physical activity programs” and “Encouraging teamwork”. It is essential to point out that no significant differences between male and female students were found for six determinants.

Saudi Arabia is divided into five geographical regions: central, western, eastern, southern, and northern. Due to time, expense, and accessibility constraints, it was decided to concentrate on one region, specifically the Eastern Region of the Kingdom. There are five universities in this region: King Fahd University of Petroleum and Minerals (KFUPM), Prince Mohammed Bin Fahd University (PMU), Imam Abdulrahman Bin Faisal University (IAU), King Faisal University (KFU), and the University of Hafr Al-Batin (UHB). This section compares the questionnaire results obtained from these five universities in the Eastern Province of Saudi Arabia. A one-way ANOVA test was performed. ANOVA provides a statistical test to determine whether the mean frequencies of several groups are equal, thereby generalizing the results of the t-test to more than two groups. The results of the “Strongly Agree” and “Agree” options show that most of the students from PMU (76%), IAU (79%), and KFU (80%) indicated that providing a “Supportive physical activity environment” influences PA promotion. Meanwhile, 81% of KFUPM students expressed interest in “High-quality facilities and equipment for physical activities”. Additionally, 80% of KFU students highlighted the importance of “Strong student-teacher relationships.” The “Qualified and experienced teachers” determinant was cited by 85% of UHB students. All five universities most frequently chose either “Strongly Disagree” or “Disagree” for “Small class sizes” as a determinant influencing physical activity promotion.

To further analyze the differences between universities, a one-way ANOVA test was performed, as shown in Table 3. As highlighted in Table 3, the p-value for five determinants is less than 0.05, indicating that the mean frequencies of all groups are not equal for the following determinants: (1) qualified and experienced teachers, (2) innovative

curriculum for PA, (3) students’ autonomy, (4) teaching strategies, and (5) integration of digital technologies. This suggests that student perceptions of these determinants vary significantly between institutions, indicating that factors such as faculty expertise, curriculum structure, and the integration of technology in PA programs are not uniformly implemented across universities. The p-value for the remaining determinants is greater than 0.05, implying that students across all universities share similar views on these aspects of PA promotion. This suggests a general consensus on the importance of factors such as student-teacher relationships, physical activity environment, and facility quality, regardless of institutional differences.

Based on the results shown in Table 3, it can be concluded that there are more similarities than differences in the determinants identified across universities in the Eastern Province of Saudi Arabia.

Students from the five universities are classified into six academic standings: preparatory year, freshman, sophomore, junior, senior, and master’s/doctoral levels. Analyzing data based on class standing can help design effective PE programs that engage students, as physical activity participation can be enhanced by addressing priorities specific to each academic level. This section compares the questionnaire results based on class standing from five universities in the Eastern Province of Saudi Arabia.

Table 4 shows that the p-value for six determinants is less than 0.05, indicating that the mean frequencies of all groups are not equal for the following determinants: (1) qualified and experienced teachers, (2) innovative curriculum for PA, (3) students’ autonomy, (4) teachers’ motivation, (5) teaching strategies, and (6) integration of digital technologies. This suggests that students at different academic levels perceive these factors differently, emphasizing the need for tailored approaches in PA promotion based on students’ progression through university.

The p-value for the remaining determinants is greater than 0.05, indicating that the mean frequencies of all groups are equal for these determinants. This suggests that students across all class standings generally agree on the importance of factors such as student-teacher relationships, physical activity environment, and facility quality for PA engagement. Based on the results shown in Table 4, it can be concluded that there are more similarities than differences in the determinants identified across class standings in universities in the Eastern Province of Saudi Arabia.

Discussion

This study aimed to identify the key determinants influencing the promotion of physical activity among university students in Saudi Arabia. The findings

Table 3. Comparative analysis among different universities for questionnaire surveys analysis

Determinants	Groups	Sum of Squares	Mean Square	F	Sig.
Autonomy	Between	17.86	4.47	4.67	.001
	Within	636.50	0.96		
Design of competitive physical activity tasks	Between	0.77	0.19	.19	.941
	Within	658.10	0.99		
Fitness promotion	Between	6.49	1.62	1.55	.185
	Within	695.19	1.04		
Fun in PA	Between	2.97	0.74	.73	.569
	Within	672.64	1.01		
Good facilities	Between	8.86	2.22	1.91	.108
	Within	772.42	1.16		
Good PA environment	Between	2.05	0.51	.50	.738
	Within	685.37	1.03		
Good student teacher relation	Between	4.46	1.12	1.25	.287
	Within	591.98	0.89		
Innovative curriculum for PA	Between	32.78	8.19	7.00	.000
	Within	778.32	1.17		
Qualified and Experienced Teachers	Between	11.43	2.86	3.62	.006
	Within	525.38	0.79		
Regular PA	Between	1.91	0.48	.47	.758
	Within	676.09	1.02		
Small class size	Between	5.74	1.44	1.15	.332
	Within	829.48	1.25		
Teacher's motivation	Between	9.64	2.41	2.03	.088
	Within	787.52	1.18		
Teaching strategies	Between	14.46	3.62	3.31	.011
	Within	726.61	1.09		
Teamwork	Between	5.08	1.27	1.20	.310
	Within	703.20	1.06		
Use of digital technologies	Between	31.24	7.81	6.00	.000
	Within	865.22	1.30		

Table 4. Comparative analysis among the universities based on class standing

Determinants	Groups	Sum of Squares	Mean Square	F	Sig.
Qualified and Experienced Teachers	Between	17.96	3.59	4.60	.000
	Within	518.85	0.78		
Competitive PA tasks	Between	7.76	1.55	1.58	.163
	Within	651.11	0.98		
Fun in PA	Between	2.78	0.56	.55	.740
	Within	672.83	1.01		
Good student teacher relation	Between	8.29	1.66	1.87	.097
	Within	588.16	0.87		
Innovative curriculum for PA	Between	24.51	4.90	4.14	.001
	Within	786.59	1.18		
Teamwork	Between	6.03	1.21	1.14	.337
	Within	702.24	1.06		
Regular PA	Between	5.26	1.05	1.04	.394
	Within	672.75	1.01		
Good facilities	Between	3.86	0.77	.66	.655
	Within	777.42	1.17		
Autonomy	Between	12.20	2.44	2.52	.028
	Within	642.16	0.97		
Teacher's motivation	Between	27.82	5.56	4.80	.000
	Within	769.33	1.16		
Good PA environment	Between	3.44	0.69	.67	.648
	Within	683.98	1.03		
Teaching strategies	Between	20.50	4.10	3.78	.002
	Within	720.57	1.08		
Fitness promotion	Between	8.30	1.66	1.59	.161
	Within	693.39	1.04		
Use of digital technologies	Between	26.89	5.38	4.11	.001
	Within	869.57	1.31		
Small class size	Between	7.66	1.53	1.23	.294
	Within	827.56	1.25		

highlight several critical factors that contribute to students' engagement in physical activities. Among them, the five most influential determinants are:

1. Qualified and experienced teachers
2. Good student-teacher relationships
3. Supportive physical activity environment
4. Enjoyment in physical activities
5. High-quality facilities and equipment

These results emphasize the importance of both instructional quality and environmental factors in fostering active participation among students.

Table 1 shows that the most critical factor influencing the promotion of physical activity is "Qualified and experienced teachers," with a percentage of 78.51. Boonsem and Chaoensupmanee indicated that teacher quality is one of the key factors impacting student achievement [12]. While students assigned to less qualified teachers tend to fall behind and often struggle to catch up, those taught by highly qualified teachers progress more rapidly.

The percentage for "Good student-teacher relationships" was identified at 76.72. Several studies have noted that positive student-teacher relationships can shape students' attitudes toward physical activity [13, 14]. Research suggests that students' perceptions, personal tendencies, and social behaviors are influenced by the personalities of PE teachers [13]. This finding indicates that emphasizing the role of PE teachers' personalities can enhance students' attitudes and habits related to physical activity, ultimately encouraging greater participation.

The third most frequently cited factor is "Supportive physical activity environment," with a percentage of 76.42. Active participation in physical education sessions can be encouraged by fostering a positive and supportive atmosphere. In such an environment, students' attention improves, anxiety decreases, and emotional and behavioral regulation is enhanced [15]. To cultivate a positive learning environment, teachers should collaborate with students to establish clear guidelines and shared expectations.

"Fun in physical activities" is the fourth most critical factor, with a percentage of 75.22. This factor is closely linked to students' motivation for engaging in physical activities, as enjoyment plays a key role in sustaining participation. Various approaches can enhance the fun aspect of physical activities, such as hiking, dance classes, team sports, and bike riding. Students are more likely to participate in physical activity when they have a positive attitude toward physical education. Enjoyable PE sessions are essential in shaping students' perceptions of physical activity. A well-structured and engaging PE class can boost participation and enhance students' confidence. The benefits of enjoying physical activity are extensive, as engaging and enjoyable sessions can improve confidence, social interactions, mental

well-being, and cognitive abilities.

The fifth most critical factor is "High-quality facilities and equipment for physical activities". Facilities and equipment play a vital role in both competitive and recreational sports, serving as key drivers of physical activity participation. Providing the right equipment in a safe environment is essential for minimizing downtime and preventing injuries. Universities should ensure access to well-maintained indoor facilities while also offering secure outdoor spaces, such as walking paths, parks, and playgrounds, to further promote physical activity among students.

Differences in the factors identified by male and female students were observed. The results of the Fisher's exact test (Table 2) indicate nine significant differences (i.e., $p < 0.05$) between the factors identified by male and female students, providing sufficient evidence that certain factors are more prevalent in one gender than the other. The findings also suggest a lack of consensus between male and female students in the Eastern Province of Saudi Arabia, highlighting disparities in nine determinants.

Gender differences in PA engagement among Saudi university students can be attributed to cultural norms, facility access, and psychological factors [16]. Cultural expectations often restrict female participation in traditional sports, leading them to prefer structured teaching methods [17]. In contrast, male students, who typically have greater exposure to competitive sports and team-based activities, favor teamwork and competition-driven PA assignments.

Access to sports facilities is another critical factor, as male students have traditionally had greater access to recreational spaces, whereas female students tend to rely more on alternative learning modalities. Psychosocial factors also influence engagement, with female students often requiring more external motivation and teacher support due to social constraints and lower self-efficacy, whereas male students are generally driven by competitiveness and peer interactions.

Differences in the identified factors were observed across universities. According to the one way ANOVA test results (Table 3), the frequency means of five factors qualified and experienced teachers, an innovative PA curriculum, students' autonomy, teaching strategies, and the use of digital technologies differ significantly across universities. However, for the remaining factors, the frequency means are consistent across all groups.

These findings suggest that universities in the Eastern Province of Saudi Arabia share more similarities than differences in the determinants influencing PA promotion. However, institutional disparities in curriculum innovation, teacher qualifications, autonomy in PA engagement, teaching strategies, and digital integration must

be addressed. Universities with lower scores in these areas may need to revise their PA courses, invest in faculty development, and implement more student centered and technology driven approaches to enhance PA participation. Addressing these differences can improve the effectiveness of PA programs, ensuring equal opportunities for students across all universities.

Differences between factors according to class standing were identified in Table 4. The one way ANOVA test results demonstrate that none of the groups' frequency means are equal for the following six factors:

- Qualified and experienced teachers.
- Innovative PA curricula.
- Autonomy.
- Teachers' motivation.
- Teaching strategies.
- Use of digital technologies.

For the remaining factors, all group frequency means are equal. It can be concluded that the factors identified based on class standing at universities in

the Eastern Province of Saudi Arabia share more similarities than differences.

These findings indicate that PA programs should be tailored to different academic levels to increase student involvement:

- Preparatory and freshman students may require more autonomy and motivational support to develop an early interest in physical activity.
- Sophomores and juniors may benefit more from structured teaching methods and curriculum innovations that keep them engaged.
- Senior and postgraduate students may prefer technology driven PA programs that accommodate their academic and time constraints.

As a result, universities should develop flexible and class specific physical activity interventions, ensuring that students at all academic levels receive tailored support to maintain an active lifestyle throughout their university years.

In this paper, four research questions have been addressed, as shown in Table 5.

Table 5. Summary of Findings and Themes

Research Question	Themes Emerged
What factors influence physical activity promotion among university students in Saudi Arabia?	Theme 1: Key factors influencing physical activity promotion The top five factors that influence physical activity promotion in Saudi Arabia are: 1. Qualified and experienced teachers. 2. Good student-teacher relationships. 3. Supportive physical activity environment. 4. Fun in physical activities. 5. High-quality facilities and equipment for physical activities.
Are there differences between the factors identified by male and female students?	Theme 3: Gender-based differences in identified factors The results of the Fisher exact test (Table 2) show nine significant differences (i.e., $p < 0.05$) between the factors identified by male and female students. This provides sufficient evidence that specific factors are more prevalent in one gender than the other. Additionally, the results indicate a lack of consensus between male and female students, with notable differences in nine factors among students in the Eastern Province of Saudi Arabia.
Are there differences between the factors identified according to different universities?	Theme 4: Institutional differences in identified factors The results of the one way ANOVA test (Table 3) show that the frequency means of all groups are not equal for the five factors: 1. Qualified and experienced teachers. 2. Innovative curriculum for PA. 3. Students' autonomy. 4. Teaching strategies. 5. Integration of digital technologies. The frequency means of all groups are equal for the remaining factors. It can be concluded that there are more similarities than differences in the factors identified across universities in the Eastern Province of Saudi Arabia.
Are there differences between the factors identified according to class standing?	Theme 5: Variations in identified factors based on class standing The results of the one way ANOVA test (Table 4) show that the frequency means of all groups are not equal for the six factors: 1. Qualified and experienced teachers. 2. Innovative curriculum for PA. 3. Students' autonomy. 4. Teachers' motivation. 5. Teaching strategies. 6. Integration of digital technologies. The frequency means of all groups are equal for the remaining factors. It can be concluded that there are more similarities than differences in the factors identified based on class standing in universities in the Eastern Province of Saudi Arabia.

This structured summary provides a clear overview of the key research findings, highlighting both commonalities and differences in the factors influencing physical activity promotion.

Practical Recommendations

To promote PA among university students, the following recommendations are proposed:

- Universities should prioritize the recruitment and continuous professional development of skilled and experienced teachers who can effectively engage students in PA.
- Mentoring and motivational strategies should be implemented to strengthen student-teacher relationships and encourage greater participation.
- Creating a supportive PA environment with well-equipped facilities is essential for enhancing student engagement.
- Incorporating enjoyable and interactive activities into physical education programs can sustain student interest and promote long-term participation.
- Given the identified similarities between institutions and class standings, universities should collaborate to develop standardized approaches for integrating these key determinants into PE programs.
- Future research should focus on designing structured interventions to effectively implement these recommendations in academic settings.

Limitations of the Study

This study has several limitations. First, it was conducted only among university students in the Eastern Province of Saudi Arabia, which may limit the generalizability of the findings to other regions with different cultural, social, or institutional contexts. Second, the use of self-reported questionnaires may introduce response bias and social desirability effects, as participants might have provided answers

they perceived as favorable rather than reflecting their actual experiences. Third, the study employed a cross-sectional design, which captures data at a single point in time and does not account for changes in students' PA engagement over time.

Conclusions

This study examined the key determinants influencing the promotion of PA among university students in Saudi Arabia. The findings highlight that qualified and experienced teachers, strong student-teacher relationships, a supportive physical activity environment, enjoyable physical activities, and well-equipped facilities are the most significant factors contributing to student engagement in PA.

The study also identified differences in the determinants based on gender, university, and class standing. Female students showed a greater preference for structured teaching methods and digital integration, while male students favored competitive and team-based activities. Institutional disparities were observed in faculty qualifications, curriculum innovation, and technological integration. Additionally, class standing influenced PA preferences, with younger students requiring more motivational support and older students favoring technology-driven approaches.

These findings emphasize the need for universities to adopt tailored strategies that address these variations. Investing in teacher development, enhancing student-teacher interactions, improving facilities, and incorporating engaging activities can significantly increase PA participation. Future research should explore intervention-based approaches to effectively implement these recommendations and assess their long-term impact on student engagement in PA.

Conflicts of Interest

The authors declare that there are no conflicts of interest related to the topics addressed in this manuscript.

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