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Md. Dilsad Ahmed * and Zuhair Al Salim

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Article

Provision of Quality Physical Education to Enhance the Motive of Physical Activity and its Underlying Behavior among University Students

Md. Dilsad Ahmed [1,*] and Zuhair Al Salim [2]

[1] College of Sciences and Human Studies, Department of Humanities and Social Sciences, Prince Mohammad Bin Fahd University, Al-Khobar, Kingdom of Saudi Arabia
[2] Sports Science and Physical Activity Department, University of Hafr Al Batin, KSA
* Correspondence: mahmed3@pmu.edu.sa; Tel.: +966 508659261

Abstract: Background: Physical activity (PA) has paramount importance for achieving good health and an active lifestyle among university students. Quality physical education (QPE) program ensures the attainment of sustainability in PA. Motivation can be considered a critical factor in promoting PA in students. However, motivation alone cannot bring inclusivity unless quality aspects are not being incorporated thoughtfully into physical education (PE) programs. **Aims**: As such this study aimed at examining three research questions: i) do the motive of PA participation can be enhanced through the quality provision of PE programs in university settings ii) does the quality provision of PE help promote *sustainable* PA among adolescents? and iii) whether or not this carry-over process is influenced by gender. **Methods**: This cross-sectional study recruited N = 610 (male = 467) & female = 143) university students. Students who studied PE as one of their course subjects were only included in this study. They participated in > 27 different sports and had a mean age of 20.76 (SD = 3.47) years and a mean of 4.70 (SD = 4.93) years of athletic experience. Descriptive (mean, SD) statistics, Pearson's correlation, and regression analysis were used to meet the objectives. To examine the variables' differences in gender, data were then computed using a 2 (Gender) by 2 (Type of Sport: Individual vs. Team) MANCOVA, with the covariate being age. **Results**: The factors provided sound reliability scores and highlighted positive correlations between QPE and exercise needs satisfaction. However, the factors lacked establishing correlations with PA. The perceived competence for exercise needs satisfaction reported differences in sexes, with the male being scored higher. Furthermore, QPE did not show any significant differences in gender. In comparison to females, males showed higher mean scores in the PA. **Conclusion:** The provision of QPE is identified as a pivotal factor in determining the competence of exercise satisfaction among students. QPE provision was adequate in the university, however, it could not promote PA among females as expected.

Keywords: autonomy; competence; eta-squared; cognitive skill; habituated behavior

Introduction

The conceptualization of Quality Physical Education (QPE) was proposed by United Nations Educational, Scientific, and Cultural Organization (UNESCO) in 1978. Its fundamental intention was to embed the provision of physical education (PE) in schools globally. Interestingly, a tailored QPE program facilitates an active lifestyle and helps understand the essence of promoting lifelong physical fitness including enhanced peer-led learning that further maximizes physical, social, emotional well-being, and motor skills (Masurier and Corbin, 2013). These all domains help profusely to address three key global crises (which were further impacted majorly due to the recent COVID pandemic) such as physical activity (PA) (decreased by 41%), mental health (worsened tremendously amongst students), and inequality (negatively impact PA participation in girls and disabled children) (UNESCO, 2015). The progress of QPE needs to advance with interest as this area leveraged rounded skills which can promote the didactic and employability outcomes of an individual (UNESCO, 2015).

PA is considered the best 'Pill' to enhance an active lifestyle (Salvo et al., 2021). Steaming to this consideration one proverb goes well as "*Health is Wealth*", which signifies its essentiality for determining a sustainable healthy future for students (Baena-Morales *et al.,* 2021). As such, sustainable physical activity (PA) (Bjørnara *et al.,* 2017) is of paramount importance for achieving optimal health and active living (Bácsné-Bába *et al*., 2021). Regular practice of PA helps derived multiple health benefits (Pacesova et al., 2019) including averting numerous health risks (Piercy et al., 2018). To attain both the mentioned favorable rewarding outcomes, regularity in PA is identified to be the key aspect (World Health Organization, 2010). Per the WHO and the European Commission (EC) a minimum of 150 (moderate) / 75 (vigorous) minutes/per week PA, or a combination of the two is recommended for adults (World Health Organization, 2010). Failing to meet these recommendations leads to physical inactivity that is further linked with numerous non-communicable diseases (NCD) risks (such as high blood pressure, diabetes, cancer, and others) and increased total mortality (Lee et al., 2012). Around >5.3 (9%) million people die annually due to physical inactivity globally (Lee et al., 2012).

The increasing physical inactivity identified as a burning issue globally and remains a pertinent discussion within the United Nations Sustainable Development Goals (SDGs) (Baena-Morales *et al.,* 2021; Salvo *et al.,* 2021). The research by Baena-Morales et al., (2021), emphasized the links between PE lessons and the SDGs. It fosters the growth of students who contribute to a more sustainable world. Their study carefully examined all of the proposed SDGs to highlight those that were pertinent to PA and sports. However, the precise nature of PE's contribution to Agenda 2030 is not stated (Baena-Morales et al., 2021). Importantly, Synergies between PA advancement and meeting several of the SDGs are conceptually coherent and supported by scientific evidence (Salvo et al., 2021). For achieving these goals, QPE help in designing our commitments to perpetuating lifelong PA that eventually alleviates the dropout rate in PA (Hulteen et al., 2017). Dropout in PA is experienced by most students (Trude and Shephard, 2008), therefore this issue needs to be discussed elaborately and cautiously.

PE and PA in Saudi Arabia

It is not more than 6 decades ago when Saudis enjoyed a simple and active lifestyle. Their daily-based physical work alone remained sufficient to keep their body lean and in a petite shape (Al-Hazzaa[a], 2004; Al-Hazzaa[b], 2004). However, the recent economic transformation with the advent of the technological revolution unequivocally brought tremendous changes to Saudi's lifestyle in terms of induced sedentary behavior, decrease PA, consumption of caloric dense diet, and others (Al-Hazzaa[a], 2004; Al-Hazzaa[b], 2004). Succinctly, all the mentioned factors enormously contributed to elevating NCDs in Saudi Arabia. Per the report of *Alarabia News (2021),* in 2021, > 25000 people died in Saudi Arabia because of cancer and diabetes. Furthermore, it is estimated that this number will be doubled (50,000) by 2025. Unfortunately, this debilitating condition targets mainly people between the ages of 20 to 39 years. The causes of these deaths are physical inactivity, sedentary behavior, and unhealthy eating habits. The exponential increase of non-communicable diseases in Saudi Arabia initiates substantial dialogue for finding strategies to de-escalate its inducing parabola remains in extreme prominence. Therefore, the idea of promoting a healthy and active lifestyle is firmly embedded in the Saudi Vision 2030 (Saudi Vision 2030) which aims to leverage "*encourage widespread and regular participation in sports and athletic activities*".

Per UNESCO's 2013 report, at the primary level children in Saudi Arabia received around 120 min. of PA/week, however, with the transition to the secondary level it declined to 45 min. of PA/week. This is less than other neighboring countries such as Qatar 75 min./week, Kuwait 40-135 PA/week, Bahrain 65 min. PA/week, Jordan 45-60 min. PA/week, and others. Furthermore, Saudi's PA level is at the bottom notch of the middle average of 40-160 min. PA/week (UNESCO, 2013).

QPE, PA, and Motivation

Motivation is considered a critical factor for encouraging and maintaining regular PA. Motives are regarded as innate mechanisms that direct and motivate behavior. They can also be triggered by

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thoughts or emotions that support or contradict those needs, such as those related to plans or expectations for oneself (Reeve, 2009). As a result, there is a commonality among the three different categories of internal motives (such as needs, cognitions, and emotions) that justify why I want to do something.

Both extrinsic and intrinsic motives can be achieved during practice and when theorizing the motivations behind PA (Frederick and Ryan, 1993). Additionally, it has been discovered that exercise goal contents can be intrinsic or extrinsic, depending on how important they are to achieving the desired endpoint (such as weight reduction to have a fit and petite body shape) (Sebire et al., 2008). Therefore, the promotion of QPE programs in educational settings (such as staffing, facility, policy, and others) incentivizes students to actualize their participation and increase regularity for a sustainable PA (Baena-Morales et al., 2021). In particular, student motivation alone cannot bring inclusivity unless quality components are not being thoughtfully incorporated into PE programs. In this case, the sustainability vision sought to ascertain whether QPE had access to enough resources to support PA's primary motivation and the corresponding student behavior. There isn't much hard evidence to support this claim, though.

The self-determination theory (SDT) clearly explains how motives can satisfy fundamental psychological needs like relatedness (believing that one is not emotionally isolated from others), competence, and autonomy (believing that one's actions are what caused them), all of which are essential building blocks for the growth of positive motivation and personal development (Deci and Ryan, 2017). Promoting intrinsic motivation (such as student-favorite sports), teacher support, expanding students' perceptions of their competence, improving PA values (Salvo et al., 2021), and community-based initiatives are crucial if PA is to be sustained. It is critical to ensure that adolescents have access to enough QPE before attempting to increase their motivation for PA. Questions like "Is there a suitable facility for PE?" and "Do students have a secure environment for PE?" were raised by Ho and others (2012). The main query raised by the aforementioned discussion is "Why," given the numerous rewarding health benefits of PA, do we frequently fall short in our efforts to promote sustainable PA? to build a healthy, long-lasting future?

This study

The alarming decline in kids' participation in healthy activities like PE (Ahmed, 2017) contrasts sharply with the rise of screen watching (Chahal et al., 2013). As teenagers get older and move from high school to college, it has been found that PA tends to decline (Maselli et al., 2018). University years remain critical for leveraging and continuing a healthy and active lifestyle. Unfortunately, despite the numerous benefits offered by PA, a significant percentage of university students do not meet prescribed recommendations. PA has been recommended to be encouraged in educational institutions by fostering intrinsic motivation (sports favoritism), teacher support, improving students' perceptions of their competence, and promoting PA values by informing students about its health benefits (Codina et al., 2016). However, there are causes for concern regarding the link between higher education and decreased PA. Because universities in many counties were found hardly ever encourage students to participate in PA (Mella-Norambuena et al., 2019). But there is a reason for optimism because college is also a period when individuals can develop healthy habits and ways of life (Maselli et al., 2018). Moreover, a country's sustainable future (*health, economy, and others*) depends on its purely healthy young generation. Because embedding active lifestyle habits during the early adolescence period remains remarkable for a sustainable healthy transition into adulthood. Due to these factors, it remains critical to comprehend both the personal factors and contextual factors (related to this behavior) that influence university students' participation in PA (Lindwall et al., 2016; Caro-Freile and Cobos, 2017). Support from others (such as a team or family members) or the planning and scheduling of the activity are all important contextual (Codina et al., 2020).

The vision of sustainability in this context was to help identify whether there is adequate *provision for QPE* to advocate the *motive of sustainable PA* and its *underlying behavior* among students. However, this claim is not well supported by empirical evidence. Therefore, furthering the research of QPE was remain promising in terms of describing students' motives for sustainable PA. Grounded

in self-determination theory, the study highlights the three broad research questions are delineated as follows:

(i) Do the motive of PA participation can be enhanced through the quality provision of PE programs in university settings
(ii) Does the quality provision of PE help promote *sustainable* PA among adolescents? and
(iii) Does gender have an impact on this carry-over process?

Methodology

Permission

Permission to conduct this cross-sectional study (Reference number: *2021/PMU/3rd FS*) was obtained from Prince Mohammed Bin Fahad University (PMU), Kingdom of Saudi Arabia. Furthermore, this research grant is initiated by the collaboration of the Prince Mohammad Bin Fahd Center for Futuristic Studies (PMFCFS) and the World Futures Studies Federation (WFSF).

Participants

To meet the study's aims $N = 610$ (male ($n = 467$) and female ($n = 143$)) students who studied PE courses participated in this study. Participants were recruited across all the departments of the university and involved in > 27 different sports. The participants' mean ages were 20.76 (SD: 3.47), and they had an average of 4.70 (SD: 4.93) years of athletic experience. Participation in the study was completely voluntary. This means they could leave the study at any time, at their discretion, and without obtaining the PI's prior approval. The data collection was concluded within 4 months of the proposal's acceptance date.

Procedure

After receiving the grant approval, the principal investigator contacted the concerned authorities for the data collection. Next, participants were approached through the university's internal portal system. Especially, the invitations were sent to those students who have studied PE as a requirement of your degree program. Upon receiving the participation confirmation, students were guided on how to proceed with the survey. Participants were then informed about the meeting place at the university. The survey was conducted on different dates for which participants were informed in advance. Participants sitting arrangement for the survey was conducted in the PMU's main auditorium, lecture halls, and classrooms. The participants were given a thorough explanation of the study's goals before the data collection began. Also, it was informed that their participation in the study was voluntary, they can quit the survey at any time without prior permission. There were two sections to the questionnaire packet. Biographical details were compiled in the first section (e.g., age, sport, number of years participating). The questionnaires listed below were filled out by participants in the second section.

Measures

Quality Physical Education (QPE)

To measure the student's perception of quality PE provision in university settings, the professional Perception of QPE (PPQPE) devised by Ho, Ahmed, and Kukurova (2021) was implemented. It consists of 48 items and eight dimensions. The 8 dimensions covered skill development and bodily awareness, facilities and norms in PE, quality teaching of PE, plans for feasibility and accessibility of PE, social norms and cultural practice, governmental input for PE, cognitive skills development, and habituated behavior in physical activities (Ho et al., 2021). Excellent psychometric properties and an internal consistency range of =.824 to =.935 were provided by the questionnaire. Items were responded on a 6-point (i.e., strongly disagree = 1, mostly disagree = 2, slightly disagree = 3, moderately agree = 4, mostly agree = 5, and strongly agree = 6) rating scale.

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Sample items are as follows "School should have a safe and suitable environment for PE lessons", "PE should be accessible to all children, whatever their ability/ disability, sex, age, cultural, race/ethnicity, religious, social or economic background" (Ho et al., 2021).

Need satisfaction

The Psychological Needs Satisfaction in Exercise (PNSE) Scale devised by Wilson, Rogers, Rodgers, & Wild, (2006) was employed to determine how students typically feel about exercise. The scales consisted of 18 items and comprised three subfactors namely i. PNSE-Perceived Competence (α = 0.91, same items are as follows "Confident I can do challenging exercise"), ii. PNSE-Perceived Autonomy (α = 0.91, sample item "Free to choose exercises I participate in"), and iii. PNSE-Perceived Relatedness (α = 0.90, sample item ("Connected to people I interact with"). Items were responded to on a 6-point Likert scale. Greater satisfaction with each need is indicated by higher scores.

Physical Activity Assessment

The Leisure Time Exercise Questionnaire (LTEQ), constructed by Godin and Shepherd in 1985, was used to examine the amount of moderate and vigorous PA (MVPA) that students engaged in during their free time. Participants had to report about their past 7-day period (a week) on the questions such as "During their leisure time how often do they involve in an activity that helped them to be sweated?" Considering 7 days (a week), during your leisure time how often do you engage in any regular activity long enough to work up a sweat (heartbeats rapidly)?". Higher scores represent a more vigorous PA. Responses were garnered on a 7-point rating scale. LTEQ is widely implemented in PE and PA to identify the intensity and nature of activities (Martin et al., 2007). In this study, students were asked if they have performed any of the listed PA items mentioned in the questionnaire for more than 15 minutes during their leisure time. Participants' responses helped identify their engagement in activities for gauging cardiorespiratory fitness levels.

Data Analysis

To measure the variability of the data descriptive statistics such as mean, standard deviation (SD), and percentages) were employed. Pearson's correlation was implemented to examine the relationship among the factors of different constructs. The reliability of the subfactors was computed using Cronbach's alpha. Furthermore, regression analysis was used to determine the role that QPE played in the prediction of PNSE. Finally, multivariate analysis of covariance (MANCOVA) was used to examine whether or not gender has an impact on this carry-over process. Data were then computed using a 2 (Gender) by 2 (Type of Sport: Individual vs. Team) MANCOVA, with the covariate being age. As an adjunct to the MANCOVA results, eta-squared (η^2) values were calculated and interpreted against Cohen's (1988) guidelines, where 0.01 = small, 0.06 = medium, and 0.14 = large differences.

Analyses were performed using IBM SPSS and R.

Primary analysis

Missing data analysis

The study's invitation was sent to 850 subjects, of which N = 610 (72.76%) participants returned with the completed survey questionnaires. To check the missing-value patterns of data, *Little's* multivariate test of Missing Completely at Random (MCAR) (Little, 1988) was implemented.

Little's test has the efficacy to check differences in variables spanning subgroups that comprise a similar pattern of missing data. The test provided $\chi 2$ distance (df =2853) = 3348.004, p = .000, identified that the data were not missing completely at random under significance level 0.00. The items' frequency analysis using the MCAR test helped identify missing values that failed to count on other variables. Therefore, multiple imputations were incorporated to impute the dataset. This technique works efficiently for producing adequate assessment (for the data MCAR) over the other outdated approaches (such as *listwise* and *pairwise* deletion). Item analysis for the QPE questionnaire

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was employed to examine the responses of the participants. To meet the purpose, frequencies, and percentages for each of the individual statements were computed using the original unimputed dataset.

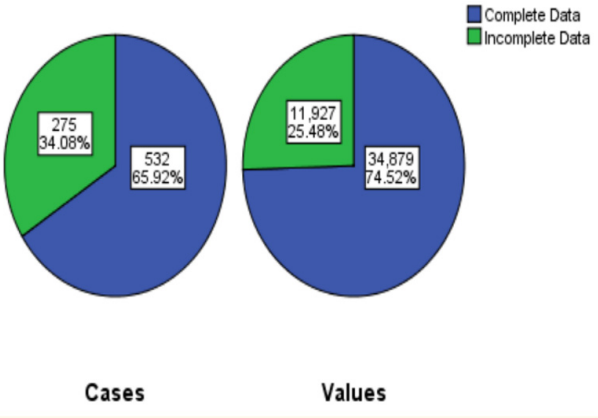

Figure 1. Overall summary of missing data.

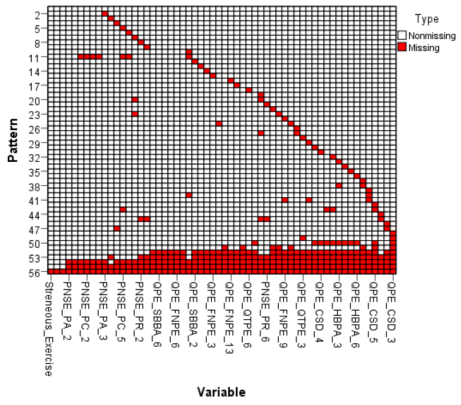

Figure 2. Missing values patterns.

Results

Pearson's correlations showed significant correlations among all the subfactors of QPE and exercise need satisfaction. However, levels of PA did not report any correlation with either QPE or the need for satisfaction in exercise. Interestingly, the subfactors of QPE and need satisfaction in exercise provided sound reliability scores.

Multiple regression analysis (Table 2) was computed to examine the variability to which need satisfaction in exercise, and PA is influenced by the QPE. As a preliminary analysis, multicollinearity was checked, if existed. The analysis did not report any multicollinearity as the tolerance level for all the factors reported < 0.1 and for VIF (variance inflation factor) >10. The analysis indicated the three predictors combined signified 63.4% of the variance (R^2 =.40, $F(3,606)$= 135.95, p<.05). The result highlighted that QPE significantly predicted PNSE-Perceived Competence (β = .199, p<.05), PNSE-Perceived Autonomy (β = -.336, p<.05), and PNSE-Perceived Relatedness (β = -.249, p<.05). Furthermore, the three predictors for physical activity explained 15.5% of the variance (R^2 =.019, $F(3,606)$= 4.97, p<.05). It was found that QPE significantly predicted Moderate Exercise (β = .088, p<.05), and Mild Exercise (β = .107, p<.05).

To examine the interaction of the variables in male and female participants MANCOVA was computed with the covariate being age and sports type. A main effect difference in Exercise satisfaction for Gender was observed and the effect was large for PNSE Competence (Wilks' λ = .98, F (1, 608) = 9.16, p <.003, η^2= .015). Also, a main effect of Sports Type has been identified for PNSE Relatedness (Wilks' λ = .97, F (1, 608) = 4.617, p <.010, η^2= .015). There was no observed interaction

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effect (Gender * Sports Type). A main effect difference in Physical Activity for Gender was observed and the effect was moderate for Mild Exercise (Wilks' λ = .96, F (1, 608) = 11.73, p <.000, η^2= .013), Strenuous Exercise (Wilks' λ = .97, F (1, 608) = 8.03, p <.012, η^2= .013), and Moderate Exercise (Wilks' λ = .97, F (1, 608) = 6.79, p <.009, η^2= .011). The subfactors of QPE did not show any significant differences between the sexes.

The results of the participants' PNSE scores are presented in Table 3. Male participants demonstrated a higher mean score in PNSE than females. The PNSE's subfactors were compared between the sexes using independent t-tests. The PNSE-Perceived Competence highlighted a significant difference between male (M = 27.22±6.73) and female (M = 27.23±7.26; t(608) = 3.47, p < 0.05, two-tailed) participants. The magnitude of the difference between the means (MD = 2.32, 95% CI) was large (eta squared = 0.33). This signifies that male students have significantly higher PNSE-Perceived Competence than their female counterparts. On the contrary, PNSE-Perceived Autonomy (male (M = 28.10±6.36) and female (M = 24.89±7.79; t(608) = 1.38, p > 0.05, two-tailed)); and PNSE-Perceived relatedness (male (M = 26.19±6.08) and female (M = 24.62±7.18; t(608) = 2.58, p > 0.05, two-tailed)) did not show any significant gender differences.

The results of the participant's perception of the quality provision of PE in school setting scores are shown in Table 4. Mean differences in gender on subfactors of QPE were analyzed using independent t-tests. None of the subfactors (SDBA for male (M = 33.88±7.04) and female (M = 33.54±8.26; t(608) = .481, p > 0.05, two-tailed); FNPE for male (M = 63.83±12.81) and female (M = 63.31±14.45; t(608) = .410, p > 0.05, two-tailed); QTPE for male (M = 27.22±6.73) and female (M = 24.89±7.79; t(608) = 3.47, p > 0.05, two-tailed); CSD for male (M = 27.22±6.73) and female (M = 24.89±7.79; t(608) = 3.47, p > 0.05, two-tailed); and HBPA for male (M = 27.22±6.73) and female (M = 24.89±7.79; t(608) = 3.47, p < 0.05, two-tailed)) showed any significant differences between the scores of male and female students.

The magnitude of the difference between the means of the subfactors such as SDBA (MD = .337, 95% CI) was small (η^2 = 0.04), FNPE (MD = .518, 95% CI) was small (η^2 = 0.03), QTPE (MD = .525, 95% CI) was small (η^2 = 0.08), CSD (MD = .014, 95% CI) was small (η^2 = 0.00), and HBPA (MD = .415, 95% CI) was small (η^2 = 0.06). This implies that participants did not show any significant difference in their perception of QPE provision.

Participants' PA levels are provided in Table 5. The result of independent samples t-tests highlighted that in comparison to females, males are involved in more PA. The strenuous PA levels of male students (M = 41.75±23.88) were significantly higher than female students (M = 35.62±15.02; t(608) = 2.89, p < 0.05, two-tailed). The magnitude of the difference between the means (MD = 6.12, 95% CI) was large (η^2 = 0.28). Similarly, the moderate PA levels of male students (M = 20.77±10.05) were significantly higher than female students (M = 18.39±9.57; t(608) = 2.50, p < 0.05, two-tailed). The magnitude of the difference between the means (MD = 2.37, 95% CI) was large (η^2 = 0.24). Also, the moderate PA levels of male students (M = 20.77±10.05) were significantly higher than female students (M = 10.55±5.60; t(608) = 1.56, p < 0.05, two-tailed). The magnitude of the difference between the means (MD = 1.56, 95% CI) was large (η^2 = 0.32).

Table 1. Correlation matrix of the variables and Cronbach's alpha.

	Mean	SD	QPE SDBA	QPE FNPE	QPE QTPE	QPE CSD	QPE HBPA	PNSE Perceived Competence	PNSE Perceived Autonomy	PNSE Perceived Relatedness	Strenuous Exercise	Moderate Exercise	Mild Exercise	α
QPE SDBA	33.80	7.34	1	.856**	.791**	.638**	.733**	.478**	.492**	.478**	-.006	.078	.101*	.904
QPE FNPE	63.70	13.20		1	.844**	.663**	.784**	.440**	.515**	.457**	-.020	.109**	.138**	.943
QPE QTPE	28.55	6.36			1	.735**	.794**	.461**	.496**	.461**	-.016	.076	.108**	.886
QPE CSD	18.85	4.67				1	.778**	.418**	.473**	.369**	-.031	.120**	.078	.894
QPE HBPA	28.40	6.30					1	.421**	.464**	.444**	-.039	.122**	.114**	.891
PNSE Perceived Competence	26.67	7.06						1	.496**	.494**	.041	.116**	.092*	.909
PNSE Perceived Autonomy	27.90	6.59							1	.432**	.007	.091*	.039	.874
PNSE Perceived Relatedness	25.83	6.39								1	.017	.071	.098*	.815
Strenuous Exercise	40.31	22.27									1	.054	.041	-
Moderate Exercise	20.21	9.98										1	.225**	-
Mild Exercise	11.74	4.95											1	-

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Table 2. Regression analysis of factors.

Variables	R	R^2	Adjusted R^2	Sig.	F	Standardized Coefficients	Collinearity Statistics	
						Beta	Tolerance	VIF
QPE	.634[a]	.402	.399	.000[a]	135.95	-	-	-
PNSE-Perceived Competence				.000		.199	.658	1.520
PNSE-Perceived Autonomy				.000		.336	.708	1.413
PNSE-Perceived Relatedness				.000		.249	.709	1.410
Physical Activity	.155[b]	.024	.019	.002[b]	4.97	-	-	-
Strenuous Exercise				.422		-.032	.996	1.004
Moderate Exercise				.033		.088	.947	1.056
Mild Exercise				.009		.107	.948	1.054

Dependent Variable: Total QPE. [a]. Predictors: (Constant), PNSE Relatedness, PNSE Autonomy, PNSE Competence. [b]. Predictors: (Constant), Mild Exercise, Strenuous Exercise, Moderate Exercise.

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Table 3. Descriptive information on the gender perception of Need Satisfaction in Exercise.

Psychological Need Satisfaction items	Male Mean± SD	Female Mean± SD	Total Mean± SD	Total Male Mean ± SD	Total Female Mean ± SD	t	Sig. (2-tailed)	MD	η^2
Perceived Competence				27.22±6.73	24.89±7.79	3.47	.001	2.32	0.33
Confident I can do challenging exercise	4.68±1.31	4.26±1.52	4.58±1.37	-	-	-	-	-	-
Capable of doing challenging exercises	4.38±1.44	4.02±1.55	4.29±1.47	-	-	-	-	-	-
Capable of completing exercise challenges	4.60±1.35	4.24±1.42	4.51±1.38	-	-	-	-	-	-
Able complete personal exercise challenge	4.49±1.39	4.16±1.49	4.41±1.42	-	-	-	-	-	-
Confident in my ability to exercise	4.33±1.44	3.92±1.54	4.23±1.48	-	-	-	-	-	-
Feel good about the ability to exercise	4.72±1.33	4.28±1.45	4.62±1.37	-	-	-	-	-	-
Perceived Autonomy				28.10±6.36	27.23±7.26	1.38	.167	.871	0.13
Free to choose exercises I participate in	4.76±1.37	4.58±1.49	4.72±1.40	-	-	-	-	-	-
Have a say in choosing exercises I do	4.51±1.49	4.43±1.56	4.49±1.51	-	-	-	-	-	-
I am in charge of my exercise program decisions	4.56±1.38	4.46±1.45	4.54±1.39	-	-	-	-	-	-
I decide what exercises I do	4.66±1.34	4.55±1.34	4.64±1.33	-	-	-	-	-	-
Free to make my own exercise decisions	4.89±1.29	4.65±1.39	4.83±1.32	-	-	-	-	-	-
Free to exercise in my own way	4.70±1.40	4.53±1.47	4.66±1.42	-	-	-	-	-	-
Perceived Relatedness				26.19±6.08	24.62±7.18	2.58	.010	1.57	0.25
Connected to people I interact with	4.20±1.54	3.85±1.66	4.12±1.57	-	-	-	-	-	-
Share a common bond with people	4.31±1.45	4.01±1.62	4.24±1.50	-	-	-	-	-	-
Close to my exercise companions	4.54±1.30	4.11±1.51	4.44±1.37	-	-	-	-	-	-
Sense of camaraderie with companions	4.34±1.44	4.28±1.57	4.32±1.47	-	-	-	-	-	-
Get along with the people I interact with	4.36±1.48	4.09±1.56	4.29±1.50	-	-	-	-	-	-
Attached to exercise companions	4.43±1.39	4.27±1.47	4.39±1.41	-	-	-	-	-	-

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Table 4. Descriptive statistics on the perception of quality physical education between male and female students.

Quality physical education items	Male Mean ± SD	Female Mean ± SD	Total Male Mean ± SD	Total Female Mean ± SD	t	Sig. (2-tailed)	MD	η^2
Skill Development and Bodily Awareness (SDBA)			33.88±7.04	33.54±8.26	.481	.631	.337	0.04
QPE enhances your physical skills.	4.88±1.29	4.79±1.46	-	-	-	-	-	
QPE enhances students' knowledge of sport-related terms.	4.90±1.23	4.77±1.40	-	-	-	-	-	
QPE enhances students' knowledge of different activities.	4.88±1.23	4.86±1.38	-	-	-	-	-	
QPE gives students chances to learn and interact with classmates	4.81±1.27	4.76±1.36	-	-	-	-	-	
QPE teaches students how important activity is to the process of growth.	4.85±1.20	4.74±1.43	-	-	-	-	-	
QPE helps students understand how their bodies work.	4.85±1.31	4.82±1.40	-	-	-	-	-	
QPE helps students to develop a habit of attending sports activities after school and use their spare time in sports wisely.	4.67±1.37	4.78±1.36	-	-	-	-	-	
Facilities and Norms in Physical Education (FNPE)			63.83±12.81	63.31±14.45	.410	.682	.518	0.03
Schools should have a safe and suitable environment for PE lessons.	5.03±1.31	5.05±1.31	-	-	-	-	-	-
Schools should have safe and suitable equipment PE lessons.	5.02±1.33	5.07±1.28	-	-	-	-	-	-
Schools should have safe and suitable facilities for physical education lessons.	5.04±1.30	4.99±1.35	-	-	-	-	-	-
Students should be given opportunities for active learning in PE lessons.	4.94±1.29	4.96±1.26	-	-	-	-	-	-
Positive sport-related attitudes and values should form a major focus in learning.	4.89±1.27	4.76±1.41	-	-	-	-	-	-
Health knowledge should be regarded as one of the major areas of learning.	4.85±1.32	4.70±1.43	-	-	-	-	-	-
Different types of physical activities and associated knowledge should form the content through which young people learn.	4.85±1.23	4.80±1.28	-	-	-	-	-	-
The teaching and learning of PE should be fun and enjoyable.	4.97±1.29	5.06±1.27	-	-	-	-	-	-
Physical education should be a compulsory subject in school for all children.	4.76±1.35	4.69±1.41	-	-	-	-	-	-
Extension of PA opportunities after-school or extra-curricular / co-curricular activities is essential in helping students extend their learning experiences in sports and physical activities.	4.66±1.30	4.67±1.39	-	-	-	-	-	-
Teachers should be qualified to teach PE.	4.92±1.31	4.93±1.37	-	-	-	-	-	-
PE should be accessible to all children, whatever their ability/disability, sex, age, culture, race/ethnicity, religious, social, or economic background.	4.95±1.29	4.80±1.51	-	-	-	-	-	-
PE is the most effective means of equipping children with the skills, attitudes, values, knowledge, and understanding for lifelong PA and sport participation.	4.88±1.28	4.76±1.32	-	-	-	-	-	-
Quality Teaching of Physical Education (QTPE)			28.68±6.18	28.15±6.92	.863	.388	.525	0.08
Learn and develop basic skills in different physical and sports activities.	4.91±1.27	4.94±1.32	-	-	-	-	-	-
Demonstrate a basic understanding of the importance of physical activities and health.	4.88±1.28	4.77±1.46	-	-	-	-	-	-

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Communicate ideas, and feelings effectively with others.	4.76±1.34	4.72±1.31	-	-	-	-	-	-
Basic motor skills within the context of appropriate physical activities of a low organization.	4.57±1.37	4.49±1.38	-	-	-	-	-	-
Demonstrate basic skills in decision-making, communication, etc.	4.76±1.26	4.63±1.32	-	-	-	-	-	-
At the middle-class level, developing appropriate health and fitness understanding that includes setting and achieving personal goals for healthy living.	4.77±1.32	4.59±1.48	-	-	-	-	-	-
Cognitive Skill Development (CSD)			18.86±4.60	18.84±4.89	.032	.975	.014	0.00
Help students develop their critical thinking skills.	4.72±1.38	4.71±1.36	-	-	-	-	-	-
Enhance students' ability in problem-solving.	4.67±1.39	4.63±1.44	-	-	-	-	-	-
Raise students' innovative thinking.	4.71±1.35	4.71±1.39	-	-	-	-	-	-
Raise students' independent thoughts.	4.72±1.36	4.63±1.45	-	-	-	-	-	-
Help students develop socially acceptable moral thinking and conduct.	4.69±1.40	4.77±1.36	-	-	-	-	-	-
Habituated Behavior in Physical Activities (HBPA)			28.50±6.13	28.08±6.84	.689	.491	.415	0.06
Demonstrate suitable decisions on actions for maintaining healthy living.	4.77±1.29	4.73±1.31	-	-	-	-	-	-
Demonstrate a habit of regular exercise.	4.82±1.29	4.79±1.36	-	-	-	-	-	-
Understand the relationship between physical and sports activities and personal and social development.	4.82±1.27	4.70±1.30	-	-	-	-	-	-
Take up suitable responsibilities to serve sports clubs or other related activities in school or the community.	4.59±1.30	4.56±1.30	-	-	-	-	-	-
Develop advanced proficiency in different physical and sports activities.	4.77±1.28	4.63±1.36	-	-	-	-	-	-
Develop necessary skills of participation in and out-of-school programs available within the community and which have the potential for lifelong long involvement and participation	4.71±1.32	4.65±1.40	-	-	-	-	-	-

Df=608.

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Table 5. Descriptive statistics on Physical activity levels between male and female students.

Physical activity levels	Range	Min.	Max.	Mean ± Std. Deviation Male	Mean ± Std. Deviation Female	Mean ± Std. Deviation Total	t	Sig. (2-tailed)	MD	η^2
Strenuous Exercise	162.00	.00	162.00	41.75±23.88	35.62±15.02	40.31±22.27	2.89	.004	6.12	0.28
Moderate Exercise	110.00	.00	110.00	20.77±10.05	18.39±9.57	20.21±9.98	2.50	.013	2.37	0.24
Mild Exercise	36.00	.00	36.00	12.11±4.67	10.55±5.60	11. ±74±4.95	3.33	.001	1.56	0.32

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Discussion

This study begins by investigating whether the quality provision of PE programs in university settings can enhance psychological needs satisfaction in exercise among university students. The study also attempted to examine whether the QPE provision contributes to the sustainability of PA. Finally, it was investigated whether gender has an impact on this carry-over process.

Male students reported a high Mean = 27.22 (SD=6.73) value in comparison to female students (M = 24.89, SD = 7.79) in PNSE-perceived competence. The factor assesses a person's ability to exercise satisfaction. This finding may be linked to the fact that male participants perceived the activity they performed may be more enjoyable and satisfactory than their female counterparts. The provided connotation is also aligned with several preceding studies. The study of Alhakbany et al., (2018) and Al-Hazzaa, (2018) eloquently reported the inconsistency of physical activity among Saudi women. This crisis has elevated obesity in this population as 91.10% do not engage in physical activity (Alqahtani et al., 2021). Importantly, this health disparity is more connected to several barriers which they face in their day-to-day life such as household responsibilities, unavailability of gym facilities in the vicinity, lack of motivation (Al-Otaibi, 2013; Awadalla et al., 2014), and others.

When someone chooses trials that are appropriate to their level of abilities is considered to be perceived competence. This means, societal and cultural norms have a tremendous impact on influencing women's attitudes toward participation in PA and sports (Hartmann-Tews, 2003). Women may be especially drawn to a setting where PA is welcomed without regard to gender. Therefore, it is important to make sure that women are sufficiently encouraged to participate in different PAs on par with men. Otherwise, barriers may increase mental pressure and limit their ability to actively participate in PA (Hamdan, 2005). Any exercise programs should be carefully planned with a high level of perceived ability or attainability in mind. Such deliverance remained critical in developing sustainable PA among students. Because perceived competence helps in learning a new set of exercise skills (Mobaraki & Soderfeldt, 2010; Lysa, 2020). Furthermore, perceived autonomy and perceived relatedness for exercise satisfaction did not show any significant differences between the sexes.

The subfactors of QPE did not show any significant differences between the sexes. This highlights that the participants perceive their university program to be adequate in disseminating QPE. They may perceive that PE curricula could promote self-awareness about their own bodies and weight reduction. Furthermore, it signifies that their program possesses a structured PE curriculum, including providing an adequate safety environment with suitable equipment and facilities for the advancement of QPE. Their non-difference in the response also advocates the possession of adequate course features and quality teaching that is inevitable for inducing the programs' accountability and expectations. Participants might perceive that QPE helps develop creativity and enhance students thinking ability to handle daily problems, order them to enhance moral behavior, and promote in them socially acceptable thinking. Additionally, it enables students to make wise decisions about how to perpetuate a healthy lifestyle through regular PA.

When considering the mean score of PA levels (strenuous, moderate, and mild exercise), male participants outperform their counterparts, females. Numerous studies have also reported a similar PA pattern in males. Alqahtani et al. (2021)'s study highlighted that of the total male population, only 28.30% participate in PA. It means more than 71.70% of the male population did not engage in PA. Similarly, this number is high in females where only 8.90% reported being engaged in PA with around 91.10% did not state any participation. Similar to those mentioned in the previous paragraph, this finding is attributable to their cultural settings. Social perceptions and recognition influence their engagement in sports and PA. A lack of such provision may restrict them to focus more on home-based activities than those designed for outdoors or can perform in open spaces. Additionally, the recent technological transformation undoubtedly increases screen time, sedentary activities, and physical inactivity (Al-Hazzaa[c], 2004; Al-Hazzaab, 2018).

Aljehani et al. (2022) study showed a decrease in the level of PA among university female students. Around 62% of students fail to meet the WHO's guidelines of performing 75 minutes of

vigorous activity and almost 70% reported not being able to accomplish 150 minutes of moderate activity/week. The study further delineates several pertinent barriers that outperform their involvement in PA. Reportedly, academic overload, unavailability of sports facilities in the vicinity, gender roles, and cultural norms are some of the impediments that lacked their participation in PA (Aljehani et al., 2022; Almaqhawi, 2021). Surprisingly, they valued academics more than PA, and also, prefer to use their free time for rest (Aljehani et al., 2022). They revealed finding interest in walking outdoors, however, the lack of roadside footpaths (Aljehani et al., 2022), and hot weather (Aljehani et al., 2022; Almaqhawi, 2021) demotivate exercisers to a large extent. Moreover, lack of parental support has also been reported as one of the key barriers that impede their engagement in PA. Positive outcomes were valued as facilitators, along with family support and general health concerns (Aljehani et al., 2022).

Conclusion

In conclusion, this study contributes to a better comprehension of gender perception of perceived competence for exercise satisfaction. The report of males scoring higher in perceived competence is more likely to be linked with the enjoyment of the. Therefore, female students should increase their involvement in PA which may help them assess their abilities for perceived competence in exercise satisfaction. The study highlights the adequacy of QPE in the university setting. However, female students reported insufficient involvement in PA.

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