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Associations between physical activity levels and quality of life dimensions among Saudi female university students: a cross-sectional analysis using WHOQOL-BREF and IPAQ-SF

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Abstract

Background and Study Aim: Physical activity is a key determinant of health and well-being, particularly among young adults. University students often face lifestyle changes that can affect their overall quality of life (QoL). The present study aimed to explore the relationship between physical activity levels and QoL among Saudi female university students.

Material and Methods: A cross-sectional design was implemented, involving 483 female undergraduates aged 18–24 years at Umm Al-Qura University. The International Physical Activity Questionnaire–Short Form (IPAQ-SF) was employed to evaluate participants' physical activity levels, while QoL was measured using the WHOQOL-BREF scale. Participants were classified into three physical activity categories: inactive, minimally active, and health-enhancing physically active (HEPA). QoL scores were categorized into poor, moderate, and good/high. Data were analyzed using variance analysis, chi-square analysis, and Friedman tests to assess group differences and the strength of associations.

Results: Significant differences were observed in weekly metabolic equivalents across physical activity levels ($p < .001$). Significant variations also emerged across QoL domains. The environmental and psychological dimensions received the highest ratings. Physical activity and QoL classifications were strongly associated ($\chi^2(4, N = 483) = 451.244$, $p < .001$), supported by large effect sizes (Cramer's $V = .683$). Among inactive students, 47.6% reported poor QoL, and none achieved high QoL. In contrast, 99.4% of those in the HEPA group reported good or high QoL.

Conclusions: Higher physical activity levels were strongly associated with better QoL. These findings highlight the importance of tailored physical activity initiatives in university settings to promote student well-being.

Keywords: university health promotion, psychological well-being, physical inactivity, student lifestyle, QoL assessment, female undergraduates.

Introduction

Physical activity is widely recognized as an important factor influencing various aspects of health and quality of life (QoL). Among university students, the transition to higher education often brings changes in behavior that may lead to more sedentary lifestyles. Academic demands and shifting social dynamics contribute to this trend. Such behavioral changes raise concerns about the potential long-term effects on well-being. Taken together, these factors highlight the need to identify effective strategies that promote physical activity and support students' overall quality of life.

Regular physical activity has several health advantages, including increased cardiovascular fitness, improved psychological health, and a reduced likelihood of developing chronic conditions such as obesity, diabetes, and depression [1]. It also fosters social connections and reduces academic stress among university students, collectively contributing to their overall QoL [2, 3].

In recent years, Saudi Arabia has experienced substantial sociological changes, particularly in the empowerment of women and the advancement of public health efforts [4]. The Vision 2030 initiative has played a key role in promoting physical activity levels. It has also expanded opportunities for women to engage in recreational and exercise-based activities [5]. Government initiatives, exemplified by the "Quality of Life" campaign, aim to increase public engagement in regular physical activity and to promote active, healthy lifestyles – particularly among women [4].

Despite these advancements, female university students in Saudi Arabia face significant challenges in maintaining adequate physical activity levels. Key barriers include cultural norms, academic pressures, and limited access to female-only sports facilities. These factors collectively hinder students from engaging regularly in physical activity [6, 7].

Sedentary behavior among Saudi university students has emerged as a significant health concern, with alarmingly high levels reported in recent studies. Data from a large-scale study

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involving 6,975 university students (49.1% female), collected through face-to-face interviews, revealed that female students spend an average of 467.38 ± 255.28 minutes daily engaged in sedentary activities [8]. Furthermore, 52.3% of the female participants reported sitting for seven or more hours per day.

This highlights the urgent need for targeted interventions to reduce sedentary behavior and promote active living. To address this issue, it is essential to design culturally sensitive programs. These should aim to create supportive environments that encourage regular physical activity among female students. By implementing such strategies, Saudi Arabia can help its female university students achieve improved health outcomes, greater life satisfaction, and enhanced QoL.

QoL is broadly defined as an individual's subjective evaluation of their position within their culture, value system, and personal circumstances. This concept encompasses several interrelated dimensions, including physical health, psychological state, social connections, and environmental conditions [9]. The WHOQOL-BREF, developed by the World Health Organization, provides a comprehensive tool for assessing these dimensions [10].

Studies using this instrument have shown that prolonged sedentary behavior is associated with lower scores in physical and psychological well-being, indicating that inactivity can negatively affect overall health [11, 12]. These findings underscore the importance of reducing sedentary habits and promoting regular physical activity, particularly in university settings where transitional life stages can strongly influence long-term behavior and overall QoL [13].

An analysis of the existing research has shown that physical activity is consistently associated with various aspects of quality of life (QoL). The authors have focused their attention on examining how different levels of physical activity relate to distinct QoL domains. They argue that a clearer understanding of this relationship is necessary to inform targeted health interventions. The authors evaluated the connection between physical activity intensity and specific dimensions of QoL using standardized assessment tools. Despite the number of studies conducted in this field, there remains a pressing need for more in-depth research that addresses contextual factors and explores this relationship with greater specificity. This aspect is particularly important for university students in Saudi Arabia, where unique sociocultural and institutional conditions must be taken into account when promoting physical activity and enhancing QoL.

The present study aimed to explore the association between physical activity levels and distinct quality of life (QoL) dimensions among Saudi female university students.

Materials and Methods

Participants

A total of 625 female undergraduate students aged between 18 and 24 years were invited to participate in the study. The research announcement was shared via a dedicated Telegram channel for female students, inviting those interested to provide their details, including university email addresses. Subsequently, participants received an email containing the International Physical Activity Questionnaire–Short Form (IPAQ-SF) [14], the WHOQOL-BREF questionnaire, and a detailed explanation of the study's terms and conditions.

After data screening, participants with excessive missing data (>18%) were excluded. This resulted in a final sample of 483 students (mean age ± SD = 20.93 ± 2 years), yielding a response rate of approximately 77.3%. Although participation was voluntary, the broad academic representation and relatively high response rate help mitigate potential self-selection bias.

Informed consent was obtained from all students who voluntarily agreed to complete the questionnaire. The inclusion criteria required participants to be female, currently enrolled in an undergraduate program, and free from any physical conditions that might hinder their ability to engage in regular physical activity. Data collection was conducted during the second and third academic semesters of 2023. These periods were selected to align with high student attendance, thereby optimizing response rates and minimizing data gaps. Ethical clearance was granted by the Committee for Graduate Studies and Scientific Research at the College of Education, Umm Al-Qura University, prior to the commencement of data collection.

Study Design

This cross-sectional study examined the association between physical activity levels and quality of life (QoL) among female students at Umm Al-Qura University in Saudi Arabia. Validated instruments were used to collect comprehensive data across multiple domains. This approach provided insights into how behavioral patterns directly impact student well-being.

Measurements and Instruments

Physical activity was assessed using the short form of the IPAQ-SF, which consists of seven self-reported items designed to evaluate physical activity during the previous seven days. Initially developed by Craig et al. [15], the tool classifies activities into three distinct categories: vigorous intensity, moderate intensity, and walking. As recommended by validated scoring protocols, total weekly physical activity was calculated by summing the duration and frequency of these activity categories.

The intensity of each activity was expressed

using the metabolic equivalent of task (MET), where one MET represents the energy cost of sitting quietly (approximately 1 kcal/kg/hour). Activity scores were calculated in MET-minutes/week by multiplying the MET value by the duration (in minutes) and frequency (in days) of each activity. These continuous scores were then classified into three levels of physical activity: inactive (<600 MET-min/week), minimally active (600–3000 MET-min/week), and health-enhancing physical activity (HEPA; >3000 MET-min/week), based on established guidelines and prior literature.

The reliability and validity of the IPAQ-SF have been established across multiple populations. In the original 12-country validation study, test-retest reliability coefficients for the short form ranged from .66 to .88, indicating acceptable measurement stability. Furthermore, its criterion validity, as evaluated through correlation with accelerometer-based data, was moderate ($r \approx 0.30$), supporting the IPAQ-SF as a valid tool for large-scale surveillance of physical activity [15]. In the present study, the internal consistency of the IPAQ-SF was assessed using Cronbach's alpha for the six physical activity items (vigorous, moderate, and walking – frequency and duration). The analysis yielded a Cronbach's alpha of $\alpha = 0.771$, indicating acceptable internal reliability for use in this population of university students.

Quality of Life Assessment

QoL was assessed using the WHOQOL-BREF instrument, a concise and standardized self-report tool developed by the World Health Organization as a shortened version of the WHOQOL-100 scale [16]. The instrument consists of 26 items designed to evaluate individuals' perceptions of their QoL over the past two weeks. Each item was rated using a five-point Likert scale, where responses ranged from 1 (indicating extreme dissatisfaction or very poor status) to 5 (indicating complete satisfaction or excellent status). The WHOQOL-BREF covers four major domains: physical health (7 items), psychological well-being (6 items), social relationships (3 items), and environmental factors (8 items). In addition to these domains, two general items assess overall QoL and satisfaction with health, which together constitute a general facet of well-being. Scoring can be conducted in three distinct ways. Initially, raw scores are obtained by summing responses for each domain. These scores can then be transformed to a standardized 4–20 scale to maintain comparability with the original WHOQOL-100 framework. A further transformation may be applied to convert these scores into a percentage format ranging from 0 to 100, thereby facilitating clearer interpretation and comparison across studies [10]. To facilitate the interpretation of overall QoL scores, the researchers categorized participants' total scores into three levels: poor (≤45), moderate (46–65), and good/high (>65).

This categorization was informed by approaches used in previous studies, including Kalra et al. (2022) [17], who employed a similar method in evaluating QoL among individuals with epilepsy, and Bani-Issa (2011) [18], who applied comparable thresholds to assess health-related QoL in residents of the United Arab Emirates. The three-level classification facilitated meaningful interpretation of QoL outcomes and enabled statistical comparisons among physical activity subgroups in the current research. In the present study, the internal consistency of the WHOQOL-BREF was assessed using Cronbach's alpha. The overall reliability of the scale was $\alpha = 0.88$. Furthermore, domain-specific alpha coefficients were calculated: Physical Health ($\alpha = 0.774$), Psychological ($\alpha = 0.749$), Social Relationships ($\alpha = 0.869$), and Environmental ($\alpha = 0.795$). All coefficients indicated acceptable to high internal reliability within the present sample.

Statistical Analysis

Statistical analyses were conducted using IBM SPSS Statistics software (version 25.0), ensuring robust data processing and accurate interpretation of results. Descriptive statistics were calculated to summarize demographic characteristics and mean scores across the four QoL domains. To assess the association between physical activity levels (Inactive, Minimally Active, HEPA) and categorized total QoL (Poor, Moderate, Good/High), Pearson's chi-square tests were performed. Effect sizes were estimated using phi and Cramer's V to evaluate the strength of association. The nonparametric Friedman test was applied to compare participant scores across the four QoL domains. A one-way analysis of variance (ANOVA) was conducted to examine differences in MET-minutes across physical activity classifications. Prior to performing ANOVA, assumptions of normality and homogeneity of variances were assessed. Normality was tested using the Shapiro–Wilk test, and Levene's test was used to verify homogeneity of variances across groups. A significance level of $p < .05$ (two-tailed) was adopted as the criterion for statistical significance. Effect sizes for ANOVA results were interpreted using partial eta squared (η^2), with thresholds of 0.01, 0.06, and 0.14 representing small, medium, and large effects, respectively [19]. For the Friedman test, effect size was measured using Kendall's W, with values between 0.0 and 0.3 indicating a weak effect, 0.3 to 0.5 indicating a moderate effect, and values above 0.5 indicating a strong effect [20]. Following significant Friedman test results, Wilcoxon signed-rank tests with Bonferroni correction were applied as post-hoc analyses to identify pairwise differences between QoL domains.

Results

The final sample consisted of 483 female university students, aged between 18 and 24 years (Table 1). According to BMI classifications provided by the World Health Organization, all participants fell within the normal to overweight range, with no individuals classified as underweight or obese. Participants represented a wide range of academic disciplines, with the highest proportions enrolled in Medical Sciences, Social Sciences, Education, and Arabic Language. In terms of academic level, the majority of students were in the early years of their undergraduate programs, with freshmen and sophomores comprising the largest groups.

Table 2 presents the results of a one-way ANOVA conducted to examine differences in physical activity levels among participants classified according to the IPAQ-SF. Students were distributed

Table 1. Demographic Profile and Descriptive Statistics of the Sample (N = 483).

Characteristic	Mean ± SD / Count	Range / Percentage (%)
Age (years)	20.93 ± 2.00	18–24
Height (cm)	164.30 ± 5.72	150–175
Weight (kg)	61.80 ± 8.20	45–80
BMI	22.88 ± 2.91	18.5–29.9
Medical Sciences	58	12.01%
Applied Sciences	50	10.35%
Education	52	10.77%
Nursing	45	9.32%
Pharmacy	40	8.28%
Design	38	7.87%
English Language	48	9.94%
Social Sciences	53	10.97%
Arabic Language	51	10.56%
Islamic Studies	48	9.94%
Business and Finance	40	8.28%
Freshman	169	35%
Sophomore	145	30%
Junior	97	20%
Senior	72	15%

Table 2. Group Differences in Physical Activity Levels (n = 483)

Variables	Source	df	SS	MS	F	p	Partial η^2
Overall METs	Between Groups	2	1.046	523.33	36.15	.000	0.131
	Within Groups	480	6.948	14.47			
	Total	482	1.053				
Inactive METs	Between Groups	2	3.345	1.672	18.90	.000	0.187
	Within Groups	165	14.520	88.00			
	Total	167	3.359				
Minimally active METs	Between Groups	2	7.650	3.825	22.75	.000	0.221
	Within Groups	160	26.900	168.13			
	Total	162	7.677				
Health-enhancing PA (HEPA) METs	Between Groups	2	11.200	5.600	29.90	.000	0.237
	Within Groups	155	36.120	233.74			
	Total	157	11.236				

Note. df - degrees of freedom; SS - sum of squares; MS - mean square; F - F-statistic; p - probability value indicating statistical significance.

across three categories: inactive, minimally active, and health-enhancing physically active (HEPA). The analysis revealed statistically significant differences across all physical activity domains, indicating consistent variation in weekly energy expenditure between groups. Most notably, a highly significant between-group difference was observed for overall MET values ($F(2, 480) = 36{,}153.26$, $p < .001$, partial $\eta^2 = 0.131$). Significant differences were also identified in the subcategories of physical activity, with large effect sizes, supporting the robustness of the classification method.

Table 3 presents the descriptive statistics and results of the Friedman test conducted to examine differences among the four domains of quality of life (QoL) for the 483 participants. The Friedman test, used as a nonparametric alternative to repeated-measures ANOVA, revealed statistically significant differences across the QoL domains ($\chi^2(3) = 919.68$, $p < .001$), suggesting that participants rated their QoL unevenly across the measured areas. Post-hoc analyses using the Wilcoxon signed-rank test with Bonferroni correction indicated that the environmental and psychological domains were rated significantly higher than the social and physical domains (all $p < .001$). The effect size, measured by Kendall's W, was 0.635, indicating a strong effect and a high level of consistency in participant rankings across QoL dimensions.

As illustrated in Table 4, a cross-tabulation analysis was conducted to explore the association between physical activity levels (Inactive, Minimally Active, and HEPA) and overall QoL classifications (Poor, Moderate, and Good/High) among female university students. The Pearson chi-square test revealed a statistically significant association between the variables, $\chi^2(4, N = 483) = 451.244$, $p < .001$. Additional tests supported this finding: the likelihood ratio test ($\chi^2 = 571.661$, $p < .001$) and the linear-by-linear association test ($\chi^2 = 306.628$, $p < .001$) confirmed the consistency and strength of the observed pattern. Effect size measures further underscored the strength of this relationship. Both the phi coefficient ($\varphi = .967$) and Cramer's V ($V = .683$) indicated a very large effect, consistent with Cohen's conventions. These results demonstrate a clear positive association between higher physical activity levels and better overall QoL outcomes.

Discussion

The aim of this study was to examine the association between physical activity levels and different dimensions of quality of life (QoL) among Saudi female university students. The results revealed significant differences in physical activity levels among participants, classified using the short form of the IPAQ-SF. These findings indicate that students engage in varying degrees of physical

Table 3. Descriptive and Friedman Test Statistics for Quality-of-Life Domains (n = 483)

QoL Domain	Mean	Std. Deviation	Min	Max	Mean Rank	Chi-Square	p-value	Kendall's W
Physical Health	58.82	22.27	25.00	85.00	1.56	919.677	.000	0.635
Psychological Health	74.42	6.99	65.00	85.00	2.77		.000	
Social Relationships	59.10	18.11	30.00	78.00	1.67		.000	
Environmental Health	75.40	18.87	26.00	92.00	3.66		.000	

Note. Kendall's W = 0.635 indicated a large effect size and strong agreement in ranked QoL scores across the four domains.

Table 4. Cross-tabulation of Physical Activity Levels and Total Quality of Life Classifications (n = 483)

Physical Activity		Classification of Total Quality of Life			Total
		Poor QoL	Moderate QoL	Good/High QoL	
Inactive	Count	79	87	0	166
	% within METs	47.6%	52.4%	0.0%	100%
minimally active	Count	0	7	154	161
	% within METs	0.0%	4.3%	95.7%	100%
HEPA	Count	0	1	155	156
	% within METs	0.0%	0.6%	99.4%	100%
Total	Count	79	95	309	483
	% within METs	16.4%	19.7%	64.0%	100%
	% within Total QoL	100%	100%	100%	100%

* Chi-square [$\chi^2(4, N = 483) = 451.244$], $p < .001$

effort, reflecting distinct behavioral and lifestyle profiles.

As shown in Table 2, the analysis demonstrated statistically meaningful differences in physical activity levels among the three IPAQ categories: inactive (34.6 percent), minimally active (33.5 percent), and HEPA (32.5 percent). Total weekly energy expenditure (MET-minutes) varied substantially among these groups ($p < .001$), and significant differences were also observed in domain-specific MET values across categories. These proportions are consistent with findings from recent national studies on comparable populations. For example, Alhussain and Turkistani [21] reported that 45.5 percent of Saudi female university students had low activity levels, 36.2 percent moderate, and only 18.3 percent high.

Although the current study suggests modest progress in physical activity engagement compared to previously reported inactivity rates from studies conducted at King Khalid University (61 percent) [22] and King Saud University (over 46 percent) [23], approximately 34.6 percent of participants were still classified as physically inactive. These students did not meet the recommended threshold of 500 MET-minutes per week, indicating that more than one-third of the sample failed to achieve sufficient physical activity levels.

These findings are in line with global evidence suggesting that even modest improvements in physical activity are associated with meaningful enhancements in health outcomes, including better metabolic profiles, mental health, and academic performance [24, 25, 26]. A combination of cultural, academic, and environmental factors specific to the Saudi university context may partly explain the observed differences. This highlights the relevance of using the IPAQ-SF to capture such behavioral variability and emphasizes the importance of implementing targeted physical activity interventions tailored to this demographic.

The analysis presented in Table 3 revealed statistically significant differences across the four QoL domains among the students, as measured by the WHOQOL-BREF. The application of the Friedman test indicated that participants' perceptions of well-being were not uniformly distributed across the domains of physical health, psychological health, social relationships, and environmental conditions ($\chi^2(3) = 919.68$, $p < .001$). These results suggest that different aspects of QoL are experienced unequally within this population. This may reflect variations in health behaviors, access to social support, and the quality of the surrounding environment.

When compared with previous national research, the distribution pattern of QoL domain scores in the present study appears broadly consistent but notably higher in magnitude. For example, in a cross-sectional study by Malibary et al. [27] involving medical students at King Abdulaziz University, the environmental domain was rated highest ($M = 67.81$), followed by psychological health ($M = 64.37$), social relationships ($M = 55.67$), and physical health ($M = 46.94$). In comparison, the current study also found the environmental and psychological domains to be rated most positively, but with higher average scores ($M = 75.40$ and $M = 74.42$, respectively), while the social ($M = 59.10$) and physical health ($M = 58.82$) domains received relatively lower ratings.

The observed differences in QoL domain scores among participants, specifically the lower ratings for physical health and social relationships and the higher score for environmental health, may be explained by various behavioral, academic, and contextual factors relevant to university life. The comparatively low mean score for physical health may reflect the sedentary lifestyle common among university students, particularly among females, who often face limited time and motivation for physical activity due to academic workload and stress [26, 27]. Additionally, increased screen time and prolonged sitting during study hours are well-documented contributors to reduced physical well-being in this population [28].

The relatively lower rating of the social relationships domain may also be linked to the combined influence of academic pressures and limited opportunities for peer interaction and participation in extracurricular activities. These factors have been shown to negatively affect perceived social support among female university students in Saudi Arabia [27].

In contrast, the environmental domain received the highest ratings, which may reflect participants' overall satisfaction with living conditions, access to resources, personal safety, and opportunities for recreation and transportation. These elements are core components of the environmental domain as defined in the WHOQOL-BREF. Such factors are generally perceived as more stable and less emotionally demanding than psychosocial dimensions, which may help explain the more favorable evaluations in this area. A similar pattern was observed in the findings reported by Malibary et al. (2019) [27], who also identified the environmental domain as the highest rated among medical students at King Abdulaziz University.

The elevated ratings in both the psychological and environmental domains may be influenced by recent national reforms in Saudi Arabia, particularly those associated with Vision 2030. These reforms emphasize women's empowerment, increased mental health awareness, and enhancements to overall quality of life [28]. Expanded access to psychological counseling, academic advising, and student support services may have contributed to more positive perceptions of emotional well-being. In addition, improvements in campus infrastructure,

safety, recreational facilities, and transportation services are likely to have strengthened satisfaction with the surrounding physical and social environment.

Taken together, these contextual factors may explain why students reported the highest QoL scores in these two domains. However, despite progress in creating supportive environments, there remains a need to develop targeted strategies that address students' physical and social well-being. Such strategies are essential to promoting a more comprehensive and balanced quality of life among university students.

The analysis presented in Table 4 underscores a robust and statistically significant association between physical activity levels and overall quality of life (QoL) among Saudi female university students. The chi-square test revealed a highly significant relationship between these variables ($\chi^2(4, N = 483) = 451.244$, $p < .001$), with additional confirmation provided by the likelihood ratio and linear-by-linear association tests. The effect sizes, measured by Cramer›s V (0.683) and the phi coefficient (0.967), indicate a strong association, suggesting a meaningful influence of physical activity on perceived QoL within this population.

An examination of the distribution across categories revealed a pronounced contrast between students with low physical activity levels and those classified as minimally active or meeting health-enhancing physical activity (HEPA) criteria. Among inactive students, none reported high QoL; approximately 47.6 percent indicated poor QoL, while 52.4 percent reported moderate QoL. In contrast, students in the minimally active and HEPA groups overwhelmingly reported good or high QoL, with proportions of 95.7 percent and 99.4 percent, respectively, and only a minimal number falling into the lower QoL categories.

These findings are consistent with a substantial body of literature that highlights the positive effects of physical activity on various dimensions of well-being. Warburton and Bredin [25] found that even moderate increases in physical activity are associated with improved mental health, increased vitality, and enhanced self-perceived quality of life. Similarly, a systematic review by Gillison et al. [31] concluded that university students who engage in regular physical activity report greater life satisfaction and lower levels of psychological distress.

The stark disparity between inactive students and their more active peers may be partially explained by the physiological and psychological benefits of physical activity, including improved mood regulation, better sleep quality, and enhanced academic performance [24, 26]. Furthermore, the results may reflect motivational and psychosocial spillover effects associated with adopting an active lifestyle, such as more assertive goal-setting behaviors and greater engagement in social and recreational contexts [32].

Overall, the evidence from this study supports the conclusion that increasing physical activity among university women is not only a matter of physical health but also a critical factor in enhancing broader dimensions of well-being. The findings emphasize the importance of implementing strategic, gender-sensitive interventions within university settings that promote sustainable physical activity habits and address existing barriers to participation.

In addition to aligning with global trends, the present study highlights cultural and environmental factors unique to the Saudi context. These include the availability of female-only fitness spaces, social norms influencing participation in outdoor activities, and gender-based limitations in recreational infrastructure. Such contextual influences shape behavioral patterns and warrant further investigation in future studies as potential moderators of the relationship between physical activity and well-being.

Limitations

This study offers valuable insights into the association between physical activity levels and quality of life (QoL) among Saudi female university students; however, several limitations should be acknowledged. First, the cross-sectional design limits the ability to draw causal inferences between physical activity and QoL outcomes. Second, the use of self-reported instruments, such as the IPAQ-SF and WHOQOL-BREF, introduces potential biases, including recall inaccuracies and social desirability effects, which may affect the validity of the responses. Third, the sample was restricted to students from a single university, which may limit the generalizability of the findings to other regions or academic contexts within Saudi Arabia. Furthermore, the reliance on subjective measures presents additional measurement challenges. The IPAQ-SF is vulnerable to recall bias, as participants may misestimate the duration or intensity of physical activity performed during the previous week. The WHOQOL-BREF, likewise, is influenced by individual perceptions, which can be shaped by temporary emotional states or the desire to respond in a socially acceptable manner. These limitations may result in over- or under-reporting, thereby affecting the precision of the observed associations. Given these methodological considerations, caution should be exercised when interpreting the findings. Future research should incorporate objective measures of physical activity, such as accelerometers or observational methods, and include more diverse, multi-institutional samples to improve the external validity and reliability of results.

Conclusions

The findings of this study reveal statistically significant differences in perceived quality of life across varying levels of physical activity among Saudi female university students. Among the four QoL domains, the psychological and environmental domains received the highest average scores, indicating more positive perceptions in these areas. Participants classified as engaging in health-enhancing physical activity (HEPA) demonstrated significantly higher MET scores and more favorable QoL ratings, particularly within these two domains. These results highlight the importance of promoting regular physical activity as a means of improving specific aspects of well-being. Future health promotion efforts within university settings should place greater emphasis on enhancing physical and social health in order to complement the relatively high ratings observed in psychological and environmental domains.

Implications

The findings from this study highlight the central role of physical activity in enhancing perceived quality of life (QoL) across multiple dimensions. The strong association between higher physical activity levels and improved QoL scores, particularly in the psychological and environmental domains, underscores the importance of implementing targeted health promotion strategies within university settings. Initiatives such as structured physical activity programs, the integration of movement into academic routines, and the removal of common barriers faced by female students may contribute to the adoption of healthier lifestyles and improved psychosocial outcomes. These results also provide evidence-based guidance for policymakers, university administrators, and health educators seeking to develop gender-sensitive interventions that support physical activity and well-being among female students in higher education institutions in Saudi Arabia.

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Conf ict of interests

The author declare that there is no conflict of interests.

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