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RESEARCH ARTICLE

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Impact of Sports Participation on Life Satisfaction among University Students: The Mediating Role of Exercise Behavior

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Abstract: Life satisfaction is an important measurement of subjective well-being, and university years are a time when students' behaviour, health, and attitudes to life are significantly influenced. While participation in sporting activities is linked to increased life satisfaction, the channel through which this benefit is mediated remains poorly understood, especially among students in Pakistan. Based on Self-Determination Theory and the broaden-and-build perspective, this study investigated the relationship between sports participation and life satisfaction, as well as the mediating role of exercise behavior. A cross-sectional survey approach with a quantitative method was used. A sample of 323 students from a population of 1,682 sports sciences students from higher education institutions of southern Khyber Pakhtunkhwa was selected through simple random sampling using Yamane's formula. Of these, 300 questionnaires were returned (92.9%). Descriptive statistics, Pearson correlation, multiple regression, PROCESS-based mediation analysis (Sobel test), and independent-samples t-tests were used to analyze data. Sports participation, exercise behavior, and life satisfaction had positive and significant correlations ($r = .624$ to $.781$, $p < .001$). Sports participation and exercise behavior together accounted for 70.7% of the variance in life satisfaction ($F = 358.17$, $p < .001$). Sports participation significantly explained exercise behavior ($b = .605$), while exercise behavior significantly explained life satisfaction ($b = .413$). Exercise behavior was a significant partial mediator ($ab = .250$, Sobel $z = 9.01$, $p < .001$). No differences were found by educational level or residence, but younger students reported greater sports participation. Institutions should promote sports participation and sustained physical activity to improve students' well-being.

Keywords: Sports Participation, Exercise Behavior, Life Satisfaction, Mediation, University Students, Khyber Pakhtunkhwa

Introduction

The subjective level of life satisfaction is considered the cognitive basis of subjective well-being (Diener et al., 1985) and is the global, cognitive evaluation that individuals make of their lives in relation to their own criteria. University students' life satisfaction is more than just a happy state of being: it is associated with academic engagement, persistence, healthy lifestyle choices and reduced risk of anxiety and depression (Chen et al., 2020; Matta et al., 2021). University is a period of transition with new academic expectations, more

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independence, financial strain and shifts in social support networks, and is a time when the development of adult wellbeing is established. Thus, the identification of modifiable factors that could increase the satisfaction with life of students is of practical importance for educators, policymakers and health professionals.

One of the most common of these factors is sports participation. Organised or team sports provide physical benefits of improvement in cardiovascular fitness, body composition, psychological benefits of reducing stress and increasing self-esteem, and social benefits of friendship, belonging and teamwork (Eime et al., 2013). Research with adolescents, university students and adults from various countries has found that participants in sport have a more positive evaluation of their lives than those who are not (Chen et al., 2020; Varca et al., 1984; Wang et al., 2020; Yu & Song, 2022). There is also evidence that sports participation is correlated to improvements in body image, self-efficacy, and self-esteem among college students (Ouyang et al., 2019), and low participation has been correlated to withdrawn and depressive symptoms among youth (Matta et al., 2021).

The relationship between sport and life satisfaction is already established; however, little is known about the origins of this relationship. Participation in sport through a semester or a tournament does not ensure that a student will be physically active in a regular and planned manner. These benefits of physical activity on mood, energy, and mental health seem to depend on regular and persistent participation in physical activity rather than sporadic participation (Biddle & Asare, 2011; Penedo & Dahn, 2005). Understood as the typical, intentional, and sustained participation in physical exercise, exercise behavior is the behavioral pathway that may turn sport participation into sustained benefits in well-being. Sport can expose students to physical activity, develop competence and enjoyment, and form social support, which then stimulates students to engage in regular physical activity, which has a direct relationship to their satisfaction with life (Li et al., 2021; Zhou et al., 2023).

There exists empirical evidence for this mechanism mainly from China, Europe, and North America (Li et al., 2021; Yu & Song, 2022; Zhou et al., 2023). The current situation of cultural, infrastructural, and economic restrictions on sport and exercise among students in Pakistan, especially in the southern districts of KP (Khyber Pakhtunkhwa), is not conducive to sport and exercise participation, and research on the psychological consequences of sport in this context is limited. A group of students and learners of sports sciences and physical education is especially relevant because they will be the next generation of teachers, coaches, and promoters of physical activity; their own habits and well-being will have an impact on the next generation.

In this context, the current study investigates the role of sport participation levels on life satisfaction and the mediation of exercise behavior between sport participation and life satisfaction among university students in the Southern KP. It also looks into the differences in perceptions amongst students based on their level of education, place of residence, and age. The study has three contributions. It is, theoretically, a test of a behavioral mechanism (exercise behavior) which links sport to well-being in terms of Self-Determination Theory. It is empirical in that it offers evidence from a research-under-researched context in South Asia. At a practical level, it advises universities on strategies for designing sports and physical activity programs that will promote enduring well-being.

Research Objectives

1. To examine the association among sports participation, exercise behavior and life satisfaction.
2. To examine the impact of sports participation and exercise behavior on students' life satisfaction.
3. To examine the mediating role of exercise behavior in the relationship between sports participation and life satisfaction.
4. To examine differences in students' responses on the study variables based on education, residence and age.

Theoretical Framework

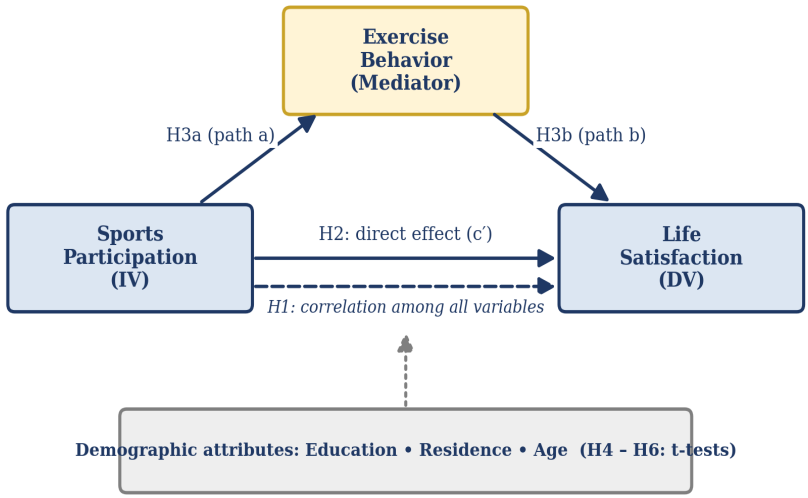
The study is based on Self-Determination Theory (SDT), indicating that human wellbeing is tied to the fulfilment of three basic psychological needs: autonomy, competence and relatedness (Basit et al., 2025). These needs can be fulfilled in the context of sport. Competence is achieved as students learn skills and enhance performance; relatedness is experienced as a result of teammates, coaches and peers; and autonomy is achieved when they select activities they value and enjoy. Once these needs are met, motivation becomes more internalized, and internally motivated behavior is more likely to last longer (Basit et al., 2025; Gao et al., 2008). In the context of the present study, participation in sport is anticipated to promote two forms of motivation for physical activity: autonomous motivation for physical activity and need satisfaction associated with physical activity, which is anticipated to increase life satisfaction and, in turn, sustained physical activity.

Another explanation comes from the broaden-and-build theory of positive emotions (Fredrickson, 2001). Sport and exercise experiences of positive emotion, such as enjoyment, pride and vitality, expand the thought-action repertoire of the moment, and over time, enrich individuals' personal resources, such as their physical health, social connections and psychological strength. These resources are then used to better evaluate one's life. The building of resources occurs through exercise behavior, which is the repetition of these positive experiences.

Both views support the conclusion that it is the direct pleasure, success, and socialisation that sport offers to its participants that have a direct impact on their life satisfaction, while the regular pattern of sport participation and the physical and psychological benefits it has for participants also have an indirect impact upon life satisfaction. Based on this logic, the conceptual model shown in Figure 1 was obtained, which shows that the use of sports is the independent variable, the behavior of exercising is the mediating variable, and the dependent variable is life satisfaction. Possible sources of group differences are explored separately in terms of demographic variables (education, residence and age).

Figure 1

Conceptual Framework of the Study



Literature Review and Hypotheses

Sports Participation and Life Satisfaction

Sports participation is defined as participation in physical activity that may include rules, skill, and competition, whether in organized teams, clubs, university competition, or as a recreational activity. A review of the psychological and social benefits of sport found that sport was related to improved self-esteem, social skills, fewer depressive symptoms and higher general well-being, and that particular social sports like team sports might be beneficial due to the social context (Eime et al., 2013). Longitudinal research reveals that

participation in sports in one's teenage years is predictive of life satisfaction later in life (Varca et al., 1984), and extensive research indicates that when adolescents engage in extracurricular sports, their life satisfaction is a result of higher levels of self-esteem and social support (Wang et al., 2020).

This is also found in cross-cultural research. For middle school students, Chen et al. concluded that physical activity was associated with positive life satisfaction in several countries (Chen et al., 2020), and Yu and Song reported that middle school students' self-efficacy and motivation were positively linked to their life satisfaction when they participated in sports (Yu & Song, 2022). Sport is seen to benefit the lives of people with disabilities in general (Diaz et al., 2019), and sport spectatorship across countries is linked to life satisfaction (Inoue et al., 2017), highlighting the overall psychological benefit of sport. In contrast, constraints that limit participation have lower levels of intrinsic motivation (Alexandris et al., 2002). From this evidence, it becomes clear that a positive relationship is expected between engagement in sports and life satisfaction, and that there is a positive impact of engagement in sports on life satisfaction.

Sports Participation and Exercise Behavior

Exercise behavior is defined as the intentional, organized, and repetitive use of physical activity to promote or maintain fitness and health and the desire to repeat the behavior over time (Sullum et al., 2000). Sport is one of the most frequently cited entry points to regular exercise. Sport helps young people learn how to move, to enjoy doing it, and to get encouragement from the coach and other players, which enhances their exercise self-efficacy and motivation (Allison et al., 1999; Gao et al., 2008). The life-course perspective indicates that early and sustained involvement in sport is a key determinant of physical activity in later life (Hirvensalo & Lintunen, 2011). Therefore, it is expected that there will be greater and more regular exercise behavior in students who participate in sport.

Exercise Behavior and Life Satisfaction

There's no mistaking the connection between exercise and health: it's one of the strongest relationships in health psychology. Regular exercise increases mood, decreases symptoms of anxiety or depression, improves sleep, and increases energy and self-worth (Biddle & Asare, 2011; Penedo & Dahn, 2005). In college students, physical exercise is associated with higher life satisfaction via self-control and lower psychological distress (Zhou et al., 2023), and regular physical exercise is related to better perceived health and quality of life (Li et al., 2021). Previous studies during the COVID-19 period, when activities were limited, demonstrated that decreases in physical activity were correlated with decreases in mental health and life satisfaction (Ammar et al., 2021). Students' life satisfaction is therefore expected to increase as a result of an increase in their exercise behavior.

The Mediating Role of Exercise Behavior

Mediation occurs when a mediator variable is caused by the independent variable, causes the dependent variable, and the relationship between the independent variable and the dependent variable is moderated by the mediator when the mediator is controlled for (Baron & Kenny, 1986; Hayes, 2018). All these links could be argued as plausible, as discussed in the previous sections: sport is associated with physical activity, and physical activity is associated with life satisfaction. Self-efficacy, motivation, self-control and self-esteem have been found to mediate the relationship between physical activity and well-being (Wang et al., 2020; Yu & Song, 2022; Zhou et al., 2023), but less often have these been tested as mediators between physical activity and well-being, especially considering that physical activity is the continuation of an activity that starts with the sport. However, partial and not full mediation is expected because the sport also gives immediate social and emotional benefits which do not rely on post-exercise.

Demographic Differences

Previous research reports mixed findings on whether sport and well-being vary across demographic groups. Age-related declines in sports participation are frequently observed as students advance through their studies

and take on more responsibilities (Hirvensalo & Lintunen, 2011), whereas differences by education level and place of residence are less consistent (Dyremyhr et al., 2014; Ouyang et al., 2019). These variables were therefore examined in an exploratory manner. In light of the literature reviewed, the following hypotheses were formulated:

1. **H1:** There is a positive and significant association among sports participation, exercise behavior and life satisfaction.
2. **H2:** Sports participation and exercise behavior have a significant positive impact on life satisfaction.
3. **H3:** Exercise behavior significantly mediates the relationship between sports participation and life satisfaction.
4. **H4:** There are significant education-based differences in students' responses on the study variables.
5. **H5:** There are significant residence-based differences in students' responses on the study variables.
6. **H6:** There are significant age-based differences in students' responses on the study variables.

Research Methodology

Research Design and Approach

This study was conducted with a positivist philosophy and a quantitative design of a cross-sectional survey (Sekaran & Bougie, 2013). A survey approach was deemed suitable due to the fact that the study variables can be measured in a standardized manner across the many respondents and the testing of hypotheses of relationships in a statistical manner. Data were gathered at one point in time using a structured self-administered questionnaire. The theoretical framework and hypotheses were developed through secondary data analysis, which involves published studies.

Population and Sample

A total of 1,682 students studying in the departments of sports sciences and physical education of higher education institutions of the southern region of Khyber Pakhtunkhwa, Pakistan, were the population under study. For the sample size, the Yamane formula with a margin of error of 5% was used, resulting in a sample size of 323 respondents (Table 1). Simple random sampling of the respondents was done. A total of 300 (92.9%) questionnaires were returned out of the 323 that were distributed. The entire research process is outlined in Figure 2.

Table 1

Sample Size Determination

Formula	Population (N)	Margin of error (e)	Calculation	Sample (n)
$n = N / (1 + Ne^2)$	1,682	0.05	$1682 / (1 + 1682 \times 0.0025) = 323.13$	323

Figure 2

Research Procedure



Instruments

The questionnaire consisted of 2 sections. The first part captured the demographic data (education, age, and residence). The second part involved measuring the three study variables by using items adapted from previously used instruments: The items for sports participation were adapted from Robertson and Emerson (2010), the life satisfaction items were adapted from Poulsen et al. (Poulsen et al., 2008) (following the global judgement approach of Diener et al. (Diener et al., 1985)), and the exercise behavior items were

adapted from Sullum et al. (Sullum et al., 2000). Each item was scored on a 5-point likert scale from 1 (strongly disagree) to 5 (strongly agree). The item scores were averaged to get composite scores for each variable, with higher scores representing higher levels of the construct. Prior to data collection, the instruments were reviewed by subject experts to ensure that they were relevant and clear in the local context.

Data Analysis

IBM SPSS Statistics was used to analyse data. Data were presented in a descriptive manner, and frequencies were calculated for the sample and variables used in the study. H2 was tested using multiple linear regression, whilst H1 was tested using Pearson's correlation coefficient. H3 was tested with the simple mediation model (Model 4) of the PROCESS macro (Hair et al., 2007) that is based on Baron and Kenny's four-path logic (1986) and the regression-based approach of Hayes (2018); the significance of the indirect effect was confirmed with the Sobel normal-theory test (1982) as per Preacher and Hayes (2008). Independent-samples t-tests were used to test H4 to H6. A $p < .05$ was considered to be statistically significant, and effect sizes were interpreted according to Cohen (1988).

Ethical Considerations

The study was carried out in compliance with the ethical guidelines of the Board of Advanced Studies and Research, Gomal University. Their involvement was voluntary, and they were made aware of the study's purpose, and their responses' anonymity and confidentiality were guaranteed. No personally identifying details were gathered, and data were only used for research.

Results and Presentation of Data

Demographic Profile of Respondents

Table 2

Demographic Profile of Respondents (N = 300)

Variable	Category	Frequency	Percent
Education	Bachelor	252	84.0
	Master	48	16.0
Age	18–22 years	202	67.3
	23 years & above	98	32.7
Residence	Local	184	61.3
	Non-local	116	38.7

Table 2 presents the demographic profile of the 300 respondents. Most respondents were enrolled in bachelor's programs (84.0%), were aged 18–22 years (67.3%), and were local residents (61.3%).

Table 3

Descriptive Statistics of Study Variables

Variable	N	Minimum	Maximum	Mean	SD
Sports Participation	300	1.50	4.40	3.114	0.637
Exercise Behavior	300	2.00	4.70	3.466	0.618
Life Satisfaction	300	1.70	4.70	3.484	0.640

As shown in Table 3, the mean scores of all variables were above the scale midpoint of 3.0. Life satisfaction had the highest mean ($M = 3.48$, $SD = 0.64$), followed by exercise behavior ($M = 3.47$, $SD = 0.62$) and sports participation ($M = 3.11$, $SD = 0.64$). The standard deviations indicate moderate and comparable variability across the three constructs

Table 4

Pearson Correlation Matrix (N = 300)

Variable	1	2	3
1. Sports Participation	1		
2. Exercise Behavior	.624**	1	
3. Life Satisfaction	.781**	.731**	1

*Note: ** Correlation is significant at the 0.01 level (2-tailed); all p < .001.*

Correlation Analysis (H1)

Pearson correlation results (Table 4) show that all three variables were positively and significantly correlated at p < .001. Sports participation was strongly correlated with life satisfaction (r = .781) and exercise behavior (r = .624), and exercise behavior was strongly correlated with life satisfaction (r = .731). All coefficients exceed Cohen's threshold for a large effect (r ≥ .50) (Cohen, 1988). H1 is therefore accepted.

Table 5

Multiple Regression Predicting Life Satisfaction

Predictor	B	SE	β	t	p
(Constant)	0.387	0.120	—	3.225	.001
Sports Participation	0.535	0.040	.532	13.246	< .001
Exercise Behavior	0.413	0.042	.399	9.916	< .001

Note: R = .841, R^2 = .707, Adjusted R^2 = .705, SE of estimate = 0.348; F(2, 297) = 358.17, p < .001. Dependent variable: Life Satisfaction.

Regression Analysis (H2)

Multiple regression was performed with sports participation and exercise behavior as predictors of life satisfaction. The model was significant, F(2, 297) = 358.17, p < .001, and explained 70.7% of the variance in life satisfaction (R^2 = .707, adjusted R^2 = .705). Both predictors made significant unique contributions (Table 4). Sports participation was the stronger predictor (B = 0.535, β = .532, t = 13.25, p < .001), followed by exercise behavior (B = 0.413, β = .399, t = 9.92, p < .001). H2 is therefore accepted.

Mediation Analysis (H3)

To test the role of exercise behavior, four regression paths were tested (Table 6). In the first path (a), sports participation significantly predicted exercise behavior (a = 0.605, SE = 0.042, t = 14.46, p < .001, 95% CI [0.523, 0.687]), explaining 38.9% of its variance. Models 2 and 3 (both variables entered) significantly explained life satisfaction (path 2: b = 0.413, p < .001; path 3: c′ = 0.535, p < .001). In the fourth path, the total effect of sports participation on life satisfaction without the mediator was c = 0.785 (SE = 0.040, t = 19.61, p < .001, 95% CI [0.706, 0.863]), explaining 61.0% of the variance.

Although the coefficient of sports participation has decreased from 0.785 (total effect) to 0.535 (direct effect), it remains significant, suggesting partial mediation. The indirect effect (a × b = 0.250) was significant according to the Sobel test (SE = 0.028, z = 9.01, p < .001). The indirect effect is about 31.8% of the total effect (0.250 / 0.785), indicating that one-third of the impact of sport participation on life satisfaction is mediated by the level of exercise behavior. The internal consistency of the estimates is checked by the decomposition c = c′ + ab (0.785 = 0.535 + 0.250). The final statistical model is therefore accepted as H3, as shown in Figure 3.

Table 6

Summary of Mediation Analysis (PROCESS Model 4)

Path	Relationship	Coefficient	SE	t / z	p	R^2
a	Sports Participation → Exercise Behavior	0.605	0.042	14.46	< .001	.389
b	Exercise Behavior → Life Satisfaction	0.413	0.042	9.92	< .001	.707
c′	Sports Participation → Life Satisfaction (direct)	0.535	0.040	13.25	< .001	.707
c	Sports Participation → Life Satisfaction (total)	0.785	0.040	19.61	< .001	.610
a × b	Indirect effect via Exercise Behavior	0.250	0.028	9.01 (z)	< .001	—

Note: Indirect effect tested with the Sobel normal-theory test. Proportion mediated = 0.250 / 0.785 ≈ 31.8%. Mediation type: partial (complementary).

Figure 3

Statistical Mediation Model with Unstandardized Path Coefficients

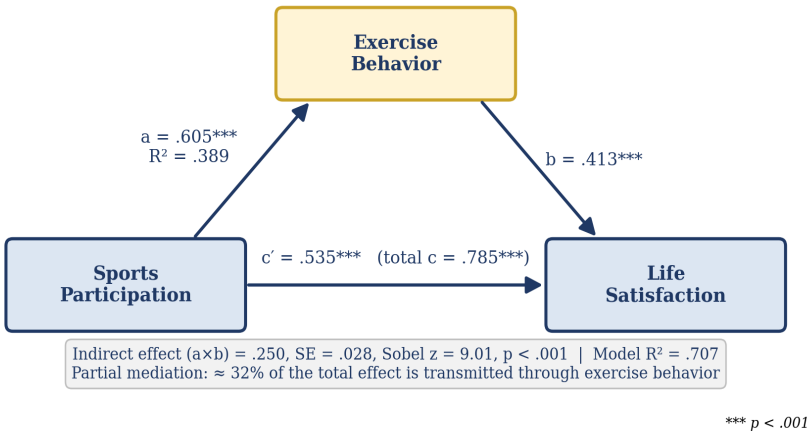


Table 7

Independent-samples t-test Results by Demographic Groups

Variable	Group	N	Mean	SD	p
Education					
Sports Participation	Bachelor / Master	252 / 48	3.129 / 3.035	0.628 / 0.683	.352
Exercise Behavior	Bachelor / Master	252 / 48	3.469 / 3.452	0.616 / 0.631	.862
Life Satisfaction	Bachelor / Master	252 / 48	3.499 / 3.406	0.618 / 0.745	.359
Residence					
Sports Participation	Local / Non-local	184 / 116	3.114 / 3.115	0.635 / 0.642	.989
Exercise Behavior	Local / Non-local	184 / 116	3.497 / 3.418	0.626 / 0.603	.284
Life Satisfaction	Local / Non-local	184 / 116	3.479 / 3.492	0.687 / 0.559	.860
Age					
Sports Participation	18–22 / 23 & above	202 / 98	3.175 / 2.989	0.587 / 0.717	.017*
Exercise Behavior	18–22 / 23 & above	202 / 98	3.458 / 3.483	0.602 / 0.651	.750
Life Satisfaction	18–22 / 23 & above	202 / 98	3.503 / 3.446	0.637 / 0.648	.474

*Note: df = 298 (equal variances assumed). * p < .05.*

Group Differences (H4–H6)

Independent-samples t-tests (Table 7) indicated that there were no significant differences between the bachelor and master students in any variable (all $p > .05$), and so H4 is not accepted. On the other hand, there was no significant difference between local and non-local students on any variable (all $p > .05$); H5 is accepted. In terms of age, students aged 18–22 years showed higher sports participation ($M = 3.17$) compared to students aged 23 years and above ($M = 2.99$; $p = .017$), although students in the two age groups did not differ in their exercise behavior or life satisfaction. This is therefore a partial acceptance of H6.

Table 8

Summary of Hypothesis Testing

Hypothesis	Statement	Statistical test	Decision
H1	Positive association among SP, EB and LS	Pearson correlation	Accepted
H2	SP and EB significantly predict LS	Multiple regression	Accepted
H3	EB mediates the SP–LS relationship	PROCESS mediation & Sobel test	Accepted (partial)
H4	Education-based differences	Independent t-test	Rejected
H5	Residence-based differences	Independent t-test	Rejected
H6	Age-based differences	Independent t-test	Partially accepted

Note: SP = Sports Participation; EB = Exercise Behavior; LS = Life Satisfaction.

Discussion

This study aimed to determine if involvement in sports improves the life satisfaction of university students and if exercise behavior accounts for some of this effect. The results are consistent with the proposed model. All three variables were highly and positively correlated with one another, and sports participation and exercise behavior explained over 70% of the variance in life satisfaction, while exercise behavior partially mediated the relationship of sports participation with life satisfaction.

The correlation between sport participation and life satisfaction ($r = .781$; total effect $c = 0.785$) is in line with the international evidence showing that there is a strong relationship between sport participation and life satisfaction (Chen et al., 2020; Eime et al., 2013; Wang et al., 2020; Yu & Song, 2022). The strength of this association in the present sample is significant. Since the respondents were students of sports sciences and physical education, sport is likely to be highly related to their identity, study aims and career plans, and thus might play a significant role in their general assessment of life. Sport provided these students with regular opportunities to feel competent, connected and autonomous (Basit et al., 2025), which are aspects of needs that are directly linked to their well-being from an SDT perspective.

The results of a strong relation of sports participation to exercise behavior ($a = 0.605$) are in line with the hypothesis that sports is a gateway to regular physical activity (Gao et al., 2008; Hirvensalo & Lintunen, 2011). Pupils who take part in sport become confident in their physical skills, learn new skills, and build a network of relationships that support them to continue physical activity. Given that sports participation was controlled, exercise behavior was found to predict life satisfaction, in line with previous studies that found greater levels of life satisfaction after exercise (Biddle & Asare, 2011; Penedo & Dahn, 2005; Zhou et al., 2023).

The findings of partial mediation are the main contribution of the study. Approximately one-third of the impact of sports participation on life satisfaction was mediated by exercise behaviors, with the other two-thirds being direct. The pattern indicates that sport has an action in well-being that is complementary and is two fold. The direct route is linked to the immediate experiences that are provided through sport, including enjoyment, achievement, recognition, or social belonging, which align with the broaden-and-build account

of positive emotions (Fredrickson, 2001). The indirect route is the accumulation of physical and psychological resources over time, due to long-term exercise behaviors. These findings add the pathway of behavioral continuation of activity to previous findings, which found that self-efficacy, self-control, and self-esteem were important mediators (Wang et al., 2020; Yu & Song, 2022; Zhou et al., 2023).

The similarities between the education level and place of residence in the demographic comparisons suggest that the sport and exercise benefits are similar across these groups. The only major difference noted was that participation in sports was higher among younger than older students. This is consistent with life course research that indicates that as youth assume greater academic, family, and work responsibilities, they are less likely to be involved in sport (Hirvensalo & Lintunen, 2011). However, it is encouraging that older students did not report lower levels of exercise behavior or life satisfaction, which could mean that they continue to be physically active in ways other than through organized sports. It is important that universities, however, be aware of the decrease in the participation of older students in sports.

Implications

The results have a number of implications for practice. To expand access to sports activities, the first step is that sports participation was the strongest predictor of life satisfaction, so this can be achieved by improving sports facilities in universities, providing a variety of team and individual sports, and organizing sports at a convenient time in students' academic schedules in Khyber Pakhtunkhwa. Second, since a portion of the benefit is dependent on regular exercise, institutions should not only strive to set up competitive events, but also develop a program of regular exercise for students through fitness clubs, structured weekly programs, and goal setting and self-monitoring. Third, coaches and physical education professionals should design environments that allow children to be autonomous, enjoy what they are doing, learn new things, and receive support from others, which will increase intrinsic motivation and promote sustained exercise behaviors (Basit et al., 2025; Gao et al., 2008). Fourth, special provision must be made to ensure that older students continue to participate in sport, such as through inter-departmental leagues, flexible formats and recreational opportunities. Lastly, the involvement of sport and exercise in student counselling and wellness services can be included as part of strategies to promote students' mental health and life satisfaction.

Limitations and Future Research

The results must be taken with some reservations in mind. The cross-sectional design does not lead to definite conclusions regarding causality; for instance, it could be that more satisfied students are more inclined to participate in sport. The direction of the relationships is suggested by using either a longitudinal or experimental design. The observed associations might have been overpowered by the sample of students from the south of KP, and the generalizability of the findings might be restricted to the students of sport sciences and those of other regions of KP; hence, further studies should involve other students from non-sport departments and other provinces in KP. Data were self-reported and self-collected from a single source, which may exclude the possibility of common-method bias; objective measures of physical activity (e.g., accelerometers) would enhance future studies. Additional recommendations for future studies include reporting reliability and validity indices for each scale, using bootstrapped confidence intervals and structural equation modeling, as well as testing additional mediators and moderators including self-efficacy, social support, gender and sport type.

Conclusion

This study concluded that university students participating in sports have a strong, positive and significant impact on their life satisfaction, and exercise behavior partially mediates the relationship between them. Sport has a direct positive impact on students' wellbeing, both in terms of enjoyment, achievement and belonging that it brings, and by inculcating a habit of regular exercise in their lives, which continues to have

a direct positive impact on their physical and psychological health. The opinions of the students were not very different by level of education or place of residence, but were generally higher across the board for younger students who participated in sports. Therefore, wherever a university seeks to advance the well-being of students, it ought to seize opportunities for athletics purposes and be mindful about fostering a habit of exercise that offers students potential advantages outside of the arena.

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