

Linking physical aspects to interpersonal competence in Filipino young adults

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Abstract

Background and Study Aim Interpersonal competence is a critical component of young adult development, influencing academic success, social relationships, and psychological well-being. Recent interest has turned toward physical and behavioral factors that may be associated with the development of these social skills. This study aims to examine how subjective physical activity and perceived physical fitness predict interpersonal competence among Filipino young adults.

Material and Methods One hundred fourteen college students (54 females, 60 males) from a state university in Region 3, Philippines, were selected through simple random sampling. Participants completed an online survey using three validated instruments: the Interpersonal Competence Questionnaire-15 (ICQ-15), the International Physical Activity Questionnaire (IPAQ), and the Self-Perception of Physical Fitness Scale. Data were analyzed using multiple linear regression in SPSS version 30. The analysis assessed the predictive capacity of the two independent variables.

Results Results showed no significant predictive relationships among female participants. However, in the male and combined samples, subjective physical activity significantly predicted initiation and disclosure. Subjective fitness was a predictor of conflict management and overall interpersonal competence. Regression analyses revealed no significant predictive relationships between subjective physical activity or fitness and any domain of interpersonal competence among female participants. In contrast, among male respondents, subjective physical activity significantly predicted initiation ($p = .021$, $R^2 = .088$), while subjective fitness predicted conflict management ($p = .039$, $R^2 = .071$) and total interpersonal competence ($p = .035$, $R^2 = .074$). In the full sample, physical activity was a significant predictor of initiation ($p = .013$, $R^2 = .054$) and disclosure ($p = .050$, $R^2 = .034$). These findings suggest domain- and gender-specific associations between physical self-perception and interpersonal competence.

Conclusions The findings suggest the potential value of integrating physical activity into comprehensive youth development programs. Such programs may benefit from addressing both physical health and interpersonal skill development, particularly among male populations.

Keywords: physical activity, physical fitness, interpersonal, young adults

Introduction

Interpersonal competence is widely recognized as a key factor in young adult development, influencing communication, conflict resolution, and relationship-building. In recent years, interest has grown in understanding how physical and psychological factors contribute to the development of these social skills. Among these, physical activity and perceptions of physical fitness have emerged as possible areas of relevance. In this context, examining the role of subjective physical activity and perceived fitness may help address questions about how non-cognitive factors support interpersonal development in youth populations.

Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure and contributes to physical fitness, as well as mental and social well-being [1]. Health-related physical activity spans various

domains, from daily activities such as walking and housework to structured exercises and sports. Each of these forms can positively impact cardiovascular, musculoskeletal, and psychological health [2]. Despite these benefits, physical inactivity remains a global public health concern. Approximately 70% of the world's population does not meet the recommended activity levels [3], and in 2016, 81% of adolescents aged 11–17 years were classified as insufficiently active [4]. In the Philippines, the 2019 Expanded National Nutrition Survey reported that 84.5% of Filipino adolescents aged 10–17 years engaged in less than the recommended 60 minutes of moderate-to-vigorous physical activity per day, with inactivity rates slightly higher among females (88.8%) than males (80.5%) [5]. This epidemiological data offers essential context for understanding the extent and urgency of physical inactivity among Filipino youth.

However, beyond these objective trends, less attention has been given to the subjective

dimensions of activity and fitness. These include how individuals perceive their own levels of physical activity and health, which may influence psychosocial outcomes. Subjective physical activity, defined as individuals' perception of their activity levels, has gained attention as a predictor of health-related outcomes. Studies have shown that higher perceived leisure-time physical activity is associated with better self-rated health and reduced negative health perceptions [6]. Among older adults, greater perceived activity has also been linked to enhanced subjective well-being and life satisfaction [7]. Moreover, subjective perceptions have been found to mediate the relationship between actual activity levels and psychological outcomes such as happiness and life satisfaction [8]. Recent Philippine-based research has further demonstrated that self-reported activity levels effectively predict muscular endurance and flexibility among university students [9]. Similarly, among Chinese college students, perceived health was shown to partially mediate the association between physical activity and subjective well-being [10].

Physical fitness is defined as the ability to perform daily tasks with vigor, without undue fatigue, and with sufficient energy to enjoy leisure activities and respond to unforeseen emergencies [11]. It includes two broad categories. Health-related fitness refers to cardiovascular endurance, muscular strength, muscular endurance, flexibility, and body composition. Skill-related fitness involves attributes such as agility, balance, coordination, power, reaction time, and speed [12]. Globally, concerns about physical fitness are growing, with evidence indicating a decline in fitness levels among adolescents and young adults due to increasingly sedentary lifestyles [13]. In the Philippines, a quasi-experimental study on the PATHFit program reported that although physical fitness levels among tertiary students improved following structured interventions, many participants still failed to meet optimal fitness standards. This was especially true for female students [14]. In parallel with objective measures, subjective physical fitness, which refers to an individual's perception of their physical condition, has emerged as an important factor associated with health behaviors, emotional well-being, and social functioning [15].

Interpersonal skills enable individuals to interact effectively, communicate clearly, and maintain positive relationships with others [16]. These skills are generally classified into several core components, including communication skills, emotional intelligence, conflict resolution, teamwork, empathy, and active listening [17]. Globally, the importance of interpersonal competence has been increasingly emphasized, with deficits linked to reduced social integration and poorer job performance [18]. In the Philippine context, studies involving the Philippine

National Police and administrators of educational institutions have indicated that interpersonal skills tend to be stronger than leadership and supervisory abilities. However, further development is needed, particularly in complex and multicultural environments [19]. One widely used instrument for assessing interpersonal competence is the Interpersonal Competence Questionnaire (ICQ-15), which conceptualizes interpersonal skills across five key domains. These domains include initiating relationships, self-disclosure, providing emotional support, asserting displeasure with others' actions, and managing interpersonal conflict [20].

Substantial evidence suggests that physical activity and physical fitness are important factors influencing the development of interpersonal skills. Physical education frameworks propose that fitness activities promote interpersonal development by engaging individuals in skill-based and movement-oriented tasks [21]. Theoretical perspectives indicate that communication competence, which is a fundamental component of interpersonal skills, can be strengthened through participation in social environments such as physical activity settings [17]. Physiological research has shown that higher levels of physical fitness are associated with healthier cardiometabolic profiles, improved psychological stability, and more positive social outcomes [22, 23]. Empirical studies support these associations. For instance, better motor skills, higher perceived self-competence, and improved fitness levels have been correlated with stronger social engagement [24]. Additionally, greater participation in physical activity has been significantly linked to higher ratings of interpersonal skills among adolescents [25]. Other findings suggest that the interpersonal skills of exercise instructors can positively affect athletes' mental health, anxiety levels, and perceptions of success [26]. In the Philippine context, improvements in physical fitness among university students participating in the PATHFit program were associated with enhanced social self-efficacy [9]. Furthermore, physical activity has been found to improve subjective well-being and emotional connectedness across various age groups [7].

An analysis of prior research findings indicates that there are both theoretical and empirical connections between subjective perceptions of physical activity and fitness and various aspects of social and emotional functioning. Nevertheless, several critical research gaps remain. First, the majority of existing studies are correlational in nature, with limited application of predictive statistical models such as linear regression to assess the extent to which physical activity and fitness predict interpersonal competence. Second, although much of the literature emphasizes objective indicators of physical activity and fitness, the role of subjective perceptions, particularly how

individuals assess their own activity and fitness levels, has received comparatively little attention in the context of interpersonal skill development. Third, a contextual limitation is evident because most prior research has focused on Western or East Asian populations. Very few studies have examined Filipino young adults, who may display culturally specific patterns in how physical self-perceptions relate to social behavior. Finally, methodological limitations persist, especially the lack of studies that integrate validated psychological instruments with predictive statistical approaches.

Given the limitations identified in previous research, there is a clear need to further examine how subjective perceptions of physical activity and fitness relate to interpersonal functioning, particularly within culturally specific populations. Based on this rationale, the following hypotheses were formulated:

H1: Subjective physical activity significantly predicts interpersonal competence.

H2: Subjective physical fitness significantly predicts interpersonal competence.

The present study aims to examine the influence of subjective physical activity and subjective physical fitness on the interpersonal competence of Filipino young adults.

Materials and Methods

Participants

One hundred fourteen students (54 females and 60 males) were selected using simple random sampling from a state university in Region 3, Philippines. All participants were officially enrolled in the course *Physical Activity Towards Health and Fitness 1* during the second semester of the 2024–2025 academic year. To ensure consistency and methodological rigor, the study applied clearly defined inclusion and exclusion criteria. Eligible participants were required to be bona fide university students who were formally registered for the course. Individuals with prior experience in formal athletic training were excluded in order to establish a uniform baseline in terms of physical fitness exposure. In addition, students from satellite campuses were excluded to maintain contextual and institutional consistency within the sample.

The final sample size was deemed appropriate for the regression analyses conducted in this

study. With two predictor variables, the commonly recommended threshold of 10 to 15 participants per predictor was not only met but exceeded [28,29], enhancing both the statistical power and the stability of the regression coefficients. In addition, the near-equal representation of male and female participants supports subgroup comparisons and contributes to the generalizability of the findings across gender. Table 1 presents the demographic characteristics of the sample, including age, height, weight, and body mass index (BMI) by sex and for the total group.

The study was conducted in accordance with established ethical standards, following approval from the in-house ethics committee of a state university college in Region 3, Philippines. Upon securing ethical clearance, data collection proceeded with formal coordination and approval from the college's research coordinator. Participants were respectfully invited to take part in the study and provided informed consent after being fully briefed on the research objectives, procedures, and confidentiality safeguards. To promote transparency and foster trust, participants were informed that the study's findings would be made available to them and to the university administration upon request.

Research Design

This study employed a quantitative research design and utilized validated, reliable instruments to collect numerical data on the primary variables. To support explanatory analysis, predictive modeling was applied to determine whether subjective physical activity and subjective physical fitness could significantly account for variation in interpersonal competence. Data collection began after receiving ethical clearance from the College of a state university located in Region III, Philippines. Participants were invited to complete an online survey administered via Google Forms, which was distributed using a simple random sampling procedure. The survey included digital versions of all validated instruments used in the study.

Interpersonal Competence Questionnaire- 15 (ICQ-15)

The Interpersonal Competence Questionnaire-15 (ICQ-15) is a brief self-report instrument designed to assess individuals' perceived competence in managing various types of social interactions (Figure 1). Adapted from the original 40-item Interpersonal

Table 1. Demographic Profile of the Respondents

Demographics	Female	Male	All
Age (years)	19.67 ± 1.82	19.72 ± 1.28	19.69 ± 1.56
Height (cm)	157.03 ± 5.94	171.27 ± 8.61	164.52 ± 10.31
Weight (kg)	54.59 ± 12.16	65.91 ± 17.14	60.55 ± 16.02
Body Mass Index (kg/m ²)	22.07 ± 4.28	22.42 ± 5.35	22.26 ± 4.88

Competence Questionnaire, the ICQ-15 consists of 15 items equally distributed across five key domains: initiation, negative assertion, emotional support, self-disclosure, and conflict management [21]. Items are rated on a 5-point Likert scale ranging from 1 (“I am poor at this”) to 5 (“I am extremely good at this”), with higher scores indicating greater perceived interpersonal competence. The ICQ-15 has demonstrated strong internal consistency, with Cronbach’s alpha values ranging from .78 to .88 across its subscales [21]. Construct validity has been supported through moderate to strong correlations with related variables, including social self-efficacy, empathy, and prosocial behavior [21].

International Physical Activity Questionnaire (IPAQ)

The International Physical Activity Questionnaire (IPAQ) was used to assess respondents’ self-reported physical activity levels [27]. The IPAQ has demonstrated strong reliability, with test-retest correlation coefficients ranging from 0.66 to 0.88 [28, 29]. Its criterion validity is supported by moderate correlations ($r = 0.30\text{--}0.50$) with objective measures such as accelerometer data [30]. The instrument also exhibits robust construct validity, effectively distinguishing among low, moderate, and high activity levels across demographic groups [31].

In the present study, IPAQ responses were converted into Metabolic Equivalent of Task (MET) scores by multiplying the number of minutes spent in each activity category (walking, moderate activity, vigorous activity) by standard MET values. The values used were 3.3 for walking, 4.0 for moderate activity, and 8.0 for vigorous activity. Total MET minutes per week were then calculated by summing the resulting scores, following the IPAQ scoring protocol.

Self-Perception of Physical Fitness Scale

Subjective physical fitness was evaluated using the Self-Perception of Physical Fitness Scale, which was developed for individuals aged 11.0 to 18.9 years [32]. The scale assesses four core dimensions of fitness: morphological fitness, muscular strength, motor fitness, and cardiovascular fitness. Each

dimension is measured using two to four items, rated on a 3-point Likert scale ranging from 1 (Strongly Disagree) to 3 (Strongly Agree). Subscale scores are calculated by averaging the item responses within each domain, with higher scores indicating more favorable self-perceptions in that area of fitness. The structure of the response scale is presented in Figure 2.

Statistical Analysis

Multiple linear regression analyses were conducted to examine whether subjective physical activity and subjective physical fitness significantly predicted interpersonal competence. All statistical procedures were performed using SPSS version 30. Prior to conducting the regression analysis, the assumptions of normality, linearity, multicollinearity, and homoscedasticity were assessed. Normality of residuals was evaluated using Q-Q plots and the Shapiro–Wilk test. Multicollinearity was examined using Variance Inflation Factor (VIF) values, all of which were below the commonly accepted threshold of 5. Residual plots were also inspected to verify homoscedasticity and to ensure there were no visible patterns indicative of model misspecification.

Results

Table 2 presents the descriptive statistics for the respondents’ interpersonal competence across five subdomains: initiation, negative assertion, emotional support, disclosure, and conflict management, as well as the overall interpersonal competence score. Scores are reported separately for female, male, and total groups. The results show generally comparable mean scores across genders, with slight variations observed across specific subdomains.

Table 3 summarizes the respondents’ self-reported subjective physical fitness across four subdomains: morphological fitness, muscular strength, motor fitness, and cardiovascular fitness, along with the total subjective fitness score. Scores are reported separately for females, males, and the overall sample. Notable gender differences are apparent in muscular strength and motor fitness,

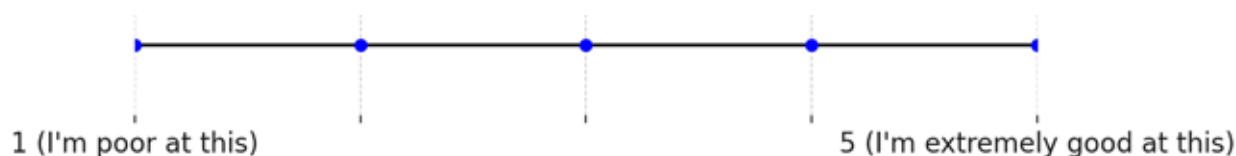


Figure 1. Likert Scale of Interpersonal Competence Questionnaire-15 (ICQ-15)



Figure 2. Likert Scale of Self-Perception of Physical Fitness Scale

where males reported higher mean scores compared to females.

Table 4 presents the respondents' self-reported subjective physical activity levels based on MET (Metabolic Equivalent of Task) scores for vigorous activity, moderate activity, and walking, as well as the total MET score. Data are disaggregated by sex and include group means and standard deviations. Gender differences are particularly evident in total MET scores and in vigorous and moderate activity levels, with males reporting substantially higher activity than females in these categories.

Table 5 presents the results of multiple linear regression analyses conducted to determine whether subjective physical activity (measured in MET) and subjective fitness (SF) significantly predict various domains of interpersonal competence among female respondents. Subjective physical activity (MET) did not significantly predict any of the interpersonal competence domains, including initiation, negative assertion, emotional support, disclosure, conflict management, or the total interpersonal competence score. Across all models, *p*-values exceeded the .05 threshold and *R*² values were minimal, indicating limited explanatory power. Consequently, Hypothesis 1 (*H*₁) was rejected for the female subgroup. Similarly, subjective fitness (SF) was not a significant predictor of any interpersonal competence domain among

female participants. Although the model predicting disclosure approached marginal significance (*p* = .105, *R*² = .050), it remained nonsignificant at the conventional alpha level. Therefore, Hypothesis 2 (*H*₂) was also rejected across all domains for females.

Table 6 presents the results of multiple linear regression analyses examining whether subjective physical activity (MET) and subjective fitness (SF) significantly predict various domains of interpersonal competence among male respondents. Subjective physical activity (MET) was found to significantly predict initiation (*p* = .021, *R*² = .088), indicating a modest yet meaningful relationship. However, MET was not a significant predictor for any of the other interpersonal competence domains, including negative assertion, emotional support, disclosure, conflict management, or the total score. Therefore, Hypothesis 1 (*H*₁) was not rejected for initiation but was rejected for all other domains. Regarding subjective fitness (SF), no statistically significant predictions were found for initiation, negative assertion, emotional support, or disclosure. Nonetheless, SF significantly predicted both conflict management (*p* = .039, *R*² = .071) and total interpersonal competence (*p* = .035, *R*² = .074), suggesting that higher levels of perceived physical fitness were associated with greater competence in these areas. Consequently, Hypothesis 2 (*H*₂) was not rejected for conflict management and total

Table 2. Level of Interpersonal Competence of the Respondents (Mean ± SD, points)

Demographics	Female	Male	All
Initiation	8.98 ± 2.64	9.25 ± 2.64	9.12 ± 2.65
Negative Assertion	10.30 ± 3.18	9.38 ± 2.88	9.82 ± 3.06
Emotional Support	12.93 ± 1.96	11.52 ± 2.67	12.18 ± 2.47
Disclosure	10.00 ± 2.52	10.67 ± 2.09	10.35 ± 2.33
Conflict Management	11.48 ± 2.28	11.17 ± 2.32	11.32 ± 2.31
Total Interpersonal Competence	53.69 ± 8.57	51 ± 9.19	52.79 ± 8.94

Table 3. Level of Subjective Fitness (Mean ± SD, points)

Fitness Domain	Female (n = 54)	Male (n = 60)	All (N = 114)
Morphological Fitness	6.70 ± 1.46	6.78 ± 1.47	6.75 ± 1.47
Muscle Strength	11.52 ± 2.46	13.70 ± 2.55	12.67 ± 2.73
Motor Fitness	10.06 ± 2.19	11.50 ± 2.31	10.82 ± 2.37
Cardiovascular Fitness	8.69 ± 1.57	9.50 ± 2.31	9.11 ± 1.74
Total Subjective Fitness	36.96 ± 5.31	39.34 ± 6.35	38.22 ± 5.99

Table 4. Level of Subjective Physical Activity (Mean ± SD, MET-min/week)

Activity Domain	Female (n = 54)	Male (n = 60)	All (N = 114)
Vigorous Activity	334.00 ± 2634.86	1706.67 ± 2062.84	2568.42 ± 2517.52
Moderate Activity	1040.00 ± 1112.35	1936.00 ± 1288.45	1511.58 ± 1352.02
Walking	1961.67 ± 1324.54	2092.20 ± 1288.45	2030.37 ± 1307.30
Total MET	4708.33 ± 3835.14	7372.20 ± 4310.35	6110.37 ± 4302.87

Table 5. Predictive analysis on Subjective physical activity and fitness, and interpersonal competence of female respondents

Hypothesis	Outcome Variable	Beta Coefficient	R ²	F	t-value	p-value	Decision
Subjective Physical Activity							
H ₁	MET→INI	.000	.021	1.105	1.051	.298	Rejected
	MET→NA	.000	.022	1.144	-1.070	.290	Rejected
	MET→ES	.000	.001	.058	.241	.810	Rejected
	MET→DIS	.000	.005	.286	.535	.595	Rejected
	MET→CM	.000	.012	.623	.790	.433	Rejected
	MET→TIC	.000	.002	.122	.350	.728	Rejected
Subjective Fitness							
H ₂	SF→INI	.028	.003	.160	.400	.691	Rejected
	SF→NA	-.084	.020	1.054	-1.027	.309	Rejected
	SF→ES	.021	.003	.167	.409	.684	Rejected
	SF→DIS	-.106	.050	2.725	-1.651	.105	Rejected
	SF→CM	-.050	.013	.711	-.843	.403	Rejected
	SF→TIC	-.192	.014	.744	-.862	.392	Rejected

Note. MET - Metabolic Equivalent of Task (minutes/week); SF - Subjective Fitness (points); INI - Initiation; NA - Negative Assertion; ES - Emotional Support; DIS - Disclosure; CM - Conflict Management; TIC - Total Interpersonal Competence; Outcome variables measured in points (ICQ-15).

Table 6. Predictive analysis on Subjective physical activity and fitness, and interpersonal competence of male respondents

Hypothesis	Outcome Variable	Beta Coefficient	R ²	F	t-value	p-value	Decision
Subjective Physical Activity							
H ₁	MET→INI	.000	.088	5.96	2.366	.021	Accepted
	MET→NA	.000	.003	.164	.405	.687	Rejected
	MET→ES	.000	.000	.009	.096	.924	Rejected
	MET→DIS	.000	.050	3.057	1.748	.086	Rejected
	MET→CM	-.000	.002	.094	-.307	.760	Rejected
	MET→TIC	.000	.021	1.271	1.127	.264	Rejected
Subjective Fitness							
H ₂	SF→INI	.104	.064	3.966	1.992	.051	Rejected
	SF→NA	.022	.002	.136	.369	.714	Rejected
	SF→ES	.090	.047	2.880	1.697	.095	Rejected
	SF→DIS	.077	.056	3.435	1.853	.069	Rejected
	SF→CM	.096	.071	4.452	2.110	.039	Accepted
	SF→TIC	.389	.074	4.656	2.158	.035	Accepted

Note. MET - Metabolic Equivalent of Task (minutes/week); SF - Subjective Fitness (points); INI - Initiation; NA - Negative Assertion; ES - Emotional Support; DIS - Disclosure; CM - Conflict Management; TIC - Total Interpersonal Competence; Outcome variables measured in points based on ICQ-15.

interpersonal competence but was rejected for the remaining domains.

Table 7 summarizes the results of multiple linear regression analyses assessing whether subjective physical activity (MET) and subjective fitness (SF) significantly predict various domains of interpersonal competence among all respondents. Subjective physical activity (MET) was found to be a significant predictor of initiation ($p = .013$, $R^2 =$

.054) and disclosure ($p = .050$, $R^2 = .034$), suggesting that higher levels of reported physical activity are modestly associated with increased competence in initiating and disclosing within interpersonal contexts. However, MET was not a significant predictor of negative assertion, emotional support, conflict management, or the total interpersonal competence score. Based on these findings, Hypothesis 1 (H₁) was not rejected for initiation and

Table 7. Predictive analysis on Subjective physical activity and fitness, and interpersonal competence of all respondents

Hypothesis	Outcome Variable	Beta Coefficient	R ²	F	t-value	p-value	Decision
Subjective Physical Activity							
H ₁	MET→INI	.000	.054	6.412	2.532	.013	Accepted
	MET→NA	-.000	.007	.797	-.893	.374	Rejected
	MET→ES	.000	.005	.548	-.741	.461	Rejected
	MET→DIS	.000	.034	3.929	1.982	.050	Accepted
	MET→CM	.000	.000	.001	.032	.974	Rejected
	MET→TIC	.000	.005	.545	.738	.462	Rejected
Subjective Fitness							
H ₂	SF→INI	.073	.031	3.537	1.881	.063	Rejected
	SF→NA	-.042	.007	.846	-.920	.360	Rejected
	SF→ES	.016	.002	.202	.450	.654	Rejected
	SF→DIS	.025	.005	.536	.732	.466	Rejected
	SF→CM	.027	.005	.616	.785	.434	Rejected
	SF→TIC	.100	.005	.566	.753	.453	Rejected

Note. MET - Metabolic Equivalent of Task (minutes/week); SF - Subjective Fitness (points); INI - Initiation; NA - Negative Assertion; ES - Emotional Support; DIS - Disclosure; CM - Conflict Management; TIC - Total Interpersonal Competence; Outcome variables measured in points based on ICQ-15 subscales.

disclosure, but was rejected for all other domains. In contrast, subjective fitness (SF) did not significantly predict any domain of interpersonal competence, including the total score. Although the regression model for initiation approached significance ($p = .063$), it did not reach the conventional alpha level. As a result, Hypothesis 2 (H₂) was rejected across all measured domains.

Discussion

This study investigated whether subjective physical activity and subjective physical fitness predict interpersonal competence among college-aged individuals. No significant predictors were found in the female subgroup. However, in the male and combined samples, significant associations emerged in specific domains, including initiation, disclosure, and conflict management. These results indicate that self-perceptions of physical activity and fitness may be related to the development of particular interpersonal skills, with patterns varying by gender and competence domain. Taken together, the findings highlight the relevance of integrating both physical and psychosocial dimensions when examining interpersonal development in young adults.

For female respondents, neither subjective physical activity (measured in METs) nor subjective fitness (SF) significantly predicted any domain of interpersonal competence. This finding aligns with prior research suggesting that women may show weaker or non-significant associations between physical self-perception and social behavior [26,

33]. One possible explanation is that gender norms influence how females evaluate and report their physical abilities or interpersonal functioning. Cultural expectations related to modesty or self-presentation may also lead to underreporting of perceived competence or fitness, reflecting common limitations of self-report measures. Furthermore, the relatively lower variability in subjective fitness scores among female participants may have limited the statistical power needed to detect potential effects. These considerations highlight the need for further qualitative research to explore how gender and cultural factors influence self-perception and interpersonal outcomes.

In contrast to the female subgroup, male participants demonstrated statistically significant associations between subjective physical activity and initiation, as well as between subjective fitness and both conflict management and overall interpersonal competence. These findings are consistent with previous research indicating that physical activity may support psychosocial outcomes such as emotional regulation, confidence, and assertiveness. These attributes are commonly reinforced within male social development contexts [34, 35, 36, 37]. In addition, prior studies have linked physical activity with improved communication skills and reduced social anxiety, both of which are relevant to interpersonal competence as conceptualized in this study [38].

Across the full sample, subjective physical activity significantly predicted initiation and disclosure, which are domains associated with self-expression

and proactive social engagement. These findings are consistent with prior research indicating that social and team-based physical activities, such as sports and group exercise, can promote self-efficacy and interpersonal confidence [39, 40]. Furthermore, longitudinal studies have demonstrated that motor competence and physical fitness during youth are strong predictors of peer acceptance and later social outcomes. This evidence further supports the potential long-term social benefits of regular physical activity [41, 42].

Although neurobiological mechanisms such as the release of dopamine, serotonin, and oxytocin are frequently discussed in the literature as possible contributors to social and emotional outcomes, such explanations remain speculative in the context of this study. As no physiological data were collected, these neurochemical processes should be regarded as theoretical interpretations rather than empirically supported findings. Future research may consider incorporating biomarkers or neuroendocrine indicators in order to investigate these mechanisms more directly and substantiate their role in interpersonal competence.

These findings can also be interpreted through several well-established psychological theories. Self-Determination Theory (SDT) posits that human flourishing depends on the fulfillment of three core psychological needs: autonomy, competence, and relatedness. Physical activity, particularly when it is self-directed and socially engaging, may support all three needs by enhancing physical confidence and facilitating the development of social bonds. This, in turn, can promote interpersonal growth [45, 40]. In addition, Social Cognitive Theory (SCT) emphasizes the roles of observational learning, self-efficacy, and reinforcement in shaping behavior. Through physical activity, individuals may build confidence in their social abilities, observe effective interpersonal behaviors in others, and receive positive feedback. These processes collectively contribute to more confident and competent interpersonal functioning [36, 44].

The Broaden-and-Build Theory of Positive Emotions also provides a useful theoretical perspective. This theory suggests that positive emotions expand individuals' cognitive and behavioral repertoires, thereby enhancing their capacity for creativity, openness, and social engagement. Although these emotional states were not directly measured in the present study, such theoretical models offer a valuable framework for understanding how subjective physical activity may influence social behavior over time.

From both theoretical and practical perspectives, the implications of these findings are noteworthy. Theoretically, the results contribute to existing models that link physical self-perception with social development and emphasize the role of

gender-specific pathways in these associations [44]. Practically, the findings suggest that targeted physical activity interventions, particularly those tailored for young men, may help develop interpersonal skills such as initiation, disclosure, and conflict resolution. More broadly, the results support the integration of physical activity into educational, wellness, and mental health programs as a means of promoting both physical and psychosocial well-being [45, 46].

Nevertheless, several limitations should be acknowledged. First, the use of self-report measures introduces potential sources of bias, including inaccurate self-assessment and the influence of social desirability. Second, the cross-sectional design of the study limits the ability to draw causal conclusions, making it unclear whether physical activity influences interpersonal competence or the reverse. Finally, the relatively homogenous, college-aged sample constrains the generalizability of the findings to more diverse populations. These limitations are consistent with those identified in previous research and underscore the need for future studies to employ more objective, longitudinal, and demographically varied methodologies [47].

Future studies should aim to incorporate objective assessments of physical activity and fitness, such as accelerometer data or VO_2 max testing, and examine potential mediating variables including self-esteem, emotional regulation, and mental health status. Longitudinal and experimental research designs would be especially valuable in clarifying the directionality and stability of the observed relationships. In conclusion, although subjective physical activity and fitness were not consistent predictors of interpersonal competence across all groups, significant associations were observed in specific domains, particularly among male participants. These findings suggest that physical self-perception may influence aspects of social behavior. However, they should be interpreted with caution and regarded as exploratory, especially in relation to theoretical mechanisms that were not empirically tested. Despite these limitations, the findings provide preliminary insights into the relationship between physical self-perceptions and interpersonal competence in young adults. They also suggest that integrated approaches addressing both physical and psychosocial factors may be valuable in future youth development initiatives.

Conclusions

This study found that although subjective physical activity and subjective fitness were not consistent predictors of interpersonal competence across all participants, significant associations were observed in specific domains, particularly

among male students. These results suggest that physical self-perceptions may be related to certain interpersonal skills, such as initiation and conflict management. The findings point to the relevance of incorporating physical activity into programs that support social development in young adults. Overall, this research contributes to the understanding of

how physical and psychosocial factors intersect in the context of youth development.

Conflict of interests

The author declare that there is no conflict of interests.

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