The Impact of Physical Exercise on Prosocial Behaviour among College Students on Pro-Social Behaviour

Ting Luo[1], Haoliang Mai[2*], Shuo Yu[3], Haiqing Wang[4], Weilin Su[2]

Abstract

This study explores the effects of physical exercise on the prosocial behaviour of college students, based on questionnaires. Online and offline methods were employed to collect 952 valid questionnaires, given the high response rate of 98.70% and effective rate of 96.45%. The research explores the mediating roles of body self-esteem and peer relationships in the exercise-prosocial behaviour link, alongside assessing the moderating influence of Body Mass Index (BMI) on the relationship between physical exercise and body self-esteem. Data were gathered using the Prosocial Behaviour Tendency Scale, Peer Relationship Scale, Body Self-Esteem Scale, Physical Activity Level Scale, and General Information Survey, and were analysed using SPSS 27.0 and the PROCESS plugin to conduct descriptive statistics, independent samples t-tests, correlation analysis, regression analysis, and mediation tests. Findings indicated no significant gender differences in physical exercise, body self-esteem, peer relationships, and prosocial behaviour (ps > 0.05), but significant differences based on registered residence and whether participants were only children (ps < 0.001). Significant correlations emerged among physical exercise, body self-esteem, peer relationships, prosocial behaviour, and BMI (ps < 0.001). In a multiple mediation model, physical exercise did not directly predict prosocial behaviour ($\beta = -0.016$, $p > 0.05$), but exerted an indirect effect through peer relationships ($p < 0.001$) and body self-esteem ($p < 0.001$), supporting the parallel multiple mediation model. Additionally, BMI moderated the relationship between physical exercise and body self-esteem ($\beta = 0.223$, $p < 0.001$). The study emphasizes that promoting physical exercise among college students can enhance body self-esteem, peer relationships, and prosocial behaviour, contributing positively to their physical and psychological well-being and fostering a harmonious campus environment. Universities are encouraged to facilitate physical activity through organized sports, competitions, and recreational pursuits such as hiking and cycling, while ensuring safety measures to protect students' physical and mental health.

Keywords: Physical Exercise, Body Self-Esteem, Peer Relationships, Prosocial Behaviour, BMI Index.

Introduction

The "National Medium- and Long-Term Education Reform and Development Plan Outline (2010-2020)" aims to promote "daily exercise, healthy growth, and lifelong benefits" to cultivate well-rounded socialist individuals who are adept in moral, intellectual, physical, aesthetic, and labour competencies. Consequently, emphasizing physical exercise is both a national imperative and a vital strategy for advancing individual development. With the growing societal awareness of physical and mental well-being, sports psychology has gradually gained recognition. Research has shown that physical exercise positively impacts mood states (Luo, 2001) and interpersonal skills (Wei, 2022), among other aspects. Studies in the field of physical exercise predominantly focus on its ability to foster positive emotions, alleviate negative emotions, enhance cognitive abilities, and improve overall life satisfaction and subjective well-being. Prosocial behaviour represents social welfare and responsibility, serving as a cornerstone for social harmony and development (Dovidio et al., 2017). Over the past decade, research on prosocial behaviour has garnered increasing attention; however, there remains a significant disparity between domestic and international studies in terms of publication volume and impact. Notably, domestic research on prosocial behaviour continues to lag behind its international counterparts, highlighting the need for further development in this area. This study aims to examine the impact of physical exercise on prosocial behaviour and to explore the multiple mediating mechanisms that link these two variables. By elucidating the underlying pathways through which physical exercise influences prosocial behaviour, the research seeks to offer valuable insights and recommendations for promoting prosocial behaviour. Additionally, it aims to enhance the existing literature by deepening the understanding of the relationship between body self-esteem and prosocial behaviour. Ultimately, this

[1] Research Center for Psychological and Health Sciences, China University of Geosciences, Wuhan, China.
[2] Faculty of Humanities and Social Sciences, City University of Macao, Macao, China, Email: haoliangmai@163.com
[3] Faculty of International Tourism and Management, City University of Macao, Macao, China.
[4] Department of Psychology, Northwest Normal University, Lanzhou, China.
*Correspondence: haoliangmai@163.com

study endeavours to confirm the positive effects of physical exercise on mental and cognitive behaviour and its broader social significance.

Literature Review

Sports, as a socially constructed activity, have been developed by humans to address their life needs. They exist in every historical period, evolving in structure and content to align with changing societal demands and thus altering their functions over time (Zhou et al., 2023). The quantification of physical exercise is generally assessed through three dimensions: intensity, duration, and frequency. Prosocial behaviour encompasses actions undertaken by individuals that benefit others, groups, or society at large (Liu, 2001). It is integral to individual socialization, supporting healthy development and social adaptation. Additionally, prosocial behaviour is a key element of moral education for adolescents (Yu & Lei, 2003). It is closely linked to concepts such as social support, cooperation, sharing, fairness, and morality. By fostering positive qualities and altruistic tendencies in social interactions, prosocial behaviour is crucial for the advancement of social organizations and communities, playing a significant role in establishing positive social relationships and facilitating social development. This study examines the mediating role of peer relationships among adolescents as a key mechanism. Peer relationships, defined as interpersonal connections among individuals of similar or close ages engaging in joint activities and mutual cooperation (Guangdong & Guangmin, 2021; Liu, Wang, & Tang, 2022), are a central focus. Qin and Qin (2023) identified a significant positive correlation between adolescent physical exercise and peer relationships, with physical exercise serving as a positive predictor of these relationships. Peer relationships have been linked to prosocial behaviour, as evidenced by intervention programs designed to enhance peer relationships, which have successfully promoted prosocial behaviour among middle school students (Jing et al., 2012). Furthermore, affiliations with social and academic peer groups have been shown to positively predict prosocial behaviours (Chinopfukutwa & Hektner, 2022).

The significance of prosocial behaviour in the lives of college students is considerable. Prosocial behaviour offers emotional and social support, which can mitigate feelings of loneliness, depression, and anxiety among college students (Hawkley & Cacioppo, 2010). Students who actively engage in prosocial behaviour are more likely to form strong friendships and achieve improved academic and social outcomes (Osterman, 2000). Additionally, prosocial behaviour is essential for the development of leadership skills and a cooperative mindset in college students (Kolb, 2014). Previous research indicates a positive correlation between physical exercise and the propensity for prosocial behaviour among college students, suggesting that physical exercise positively impacts their inclination towards prosocial behaviour (Weifeng & Guanlan, 2022). Building on these findings, this study proposes a hypothetical model, illustrated in Figure 1.

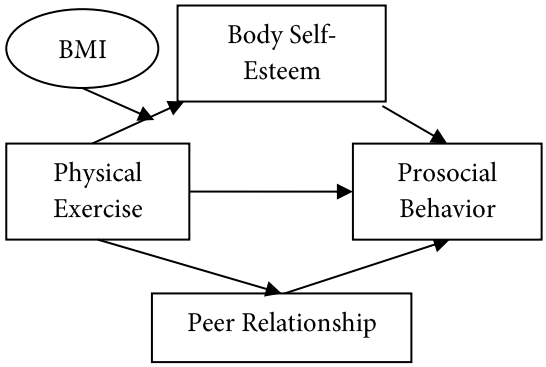

Figure 1: Hypothetical Model of the Impact of Physical Exercise on Prosocial Behaviour.

This study aimed to test the following hypotheses:

H1: *Physical exercise positively predicts prosocial behaviour.*

H2: *Body self-esteem and peer relationships serve as parallel multiple mediators between physical exercise and prosocial behaviour.*

H3: *Weight status (BMI) moderates the relationship between physical exercise and body self-esteem.*

Methodology

Research Methods

This study employed a questionnaire method to collect data from college students, using both online and offline distribution. The questionnaires included a self-designed demographic survey, a sports activity level scale, a body self-esteem scale, a peer relationship scale, and a prosocial behaviour tendency scale. Data analysis involved descriptive statistics, independent samples t-tests, and correlation analysis with SPSS 27.0, while multiple mediating effects were examined using the PROCESS plugin.

Questionnaire Survey Method

Physical Activity Rating Scale

The intensity, duration, and frequency of the physical activity were measured by the revised Physical Activity Rating Scale developed by Liang (1994) The total exercise volume is calculated by multiplying these scores. The scale showed strong reliability with a Cronbach's α of 0.823.

Physical Self-Perception Profile

Body self-esteem was measured using the revised form of the Physical Self-Perception Profile developed by Xu Xia and Xia and Jiaxin (2001). It is a multidimensional scale consisting of 30 items, divided into five sub-scales: physical self-worth, sport competence, physical condition, physical attractiveness, and actual physical fitness. Each of the above-mentioned five sub-scales is characterized by the higher the score, the higher self-esteem in respective domains This scale obtained an internal consistency coefficient of 0.980, indicating very good reliability and hence is appropriate for research measurement.

Peer Relationship Scale

To examine the impact of physical activity on peer relationships, the study employed the Chinese Youth Sports Friendship Quality Scale, developed by Zhu et al. (2010), with modifications to better align with the research aims. Terms related to training and competition were replaced with the broader concept of "physical exercise." The questionnaire, comprising 25 items, used a 5-point Likert scale, with scores ranging from 25 to 125; higher scores indicated stronger peer relationships. The scale demonstrated high reliability, with an internal consistency coefficient (Cronbach's α) of 0.976.

Prosocial Tendencies Measure

To evaluate individuals' tendencies towards prosocial behaviour, the study used the revised Prosocial Tendencies Measure (PTM) developed by Kou et al. (2007). The PTM includes 26 items across six dimensions, such as altruism, anonymity, and emergency. Scores are recorded using a 5-point scale, with higher total scores indicating stronger prosocial tendencies. The PTM, applicable to adolescents and college students (Kou et al., 2007), exhibited high reliability in this study, with an internal consistency coefficient (Cronbach's α) of 0.978.

Subjects

A total of 952 valid responses were obtained from college students through online and offline questionnaires, achieving a response rate of 98.70% and an effective rate of 96.45%. The sample included 448 males (47.06%) and 504 females (52.94%). Most students (55.46%) were from urban areas, while 44.54% were from rural areas. Among the participants, 20.80% were only children, and 79.20% had siblings. The academic year distribution was as follows: 7.77% freshmen, 12.82% sophomores, 22.06% juniors, 9.45% seniors, 19.54% fifth-year students, 15.76% first-year graduate students, 7.14% second-year graduate students, and 5.46% third-year graduate students. In terms of academic disciplines, 31.30% were in humanities, 34.24% in sciences, 25.84% in engineering, and 8.61% in other fields.

Analysis of Results

Common Method Bias Test

In this study, data on physical exercise, body self-esteem, peer relationships, and prosocial behaviour were collected through self-report scales. This methodology introduces the potential for common method bias, where the participants' responses might be influenced by the measurement approach itself rather than accurately representing the true relationships between the variables. To address potential common method bias, the Harman one-way test was employed to assess the extent of variance explained by a single factor in the factor analysis without rotation. The results showed that the first factor accounted for 27.46% of the variance, below the 40% threshold, suggesting minimal common method bias. However, some degree of bias may still exist, warranting cautious interpretation of the results and consideration of additional methods such as multi-source data or longitudinal designs to further mitigate potential bias.

Table 1

Descriptive Statistics of Basic Demographic Information and Key Variables (N = 952)

	N	Physical Exercise	Body Self-Esteem	Peer Relationships	Prosocial Behaviour
		M±*SD*	*M*±*SD*	*M*±*SD*	*M*±*SD*
Male	448	30.768±20.165	87.487±24.176	85.022±25.270	88.397±27.967
Female	504	29.881±22.141	84.385±24.964	82.996±26.478	85.845±28.700
t		0.643	1.942	1.204	1.386
City	528	33.205±20.449	92.731±21.084	91.159±21.860	95.023±24.094
Rural	424	26.679±21.643	77.269±26.026	74.972±27.745	77.113±30.135
t		9.900***	4.738***	9.814***	9.948***
Only Children	198	21.667±19.993	72.879±25.606	70.889±28.168	72.889±30.345
Non-Only Children	754	32.565±20.971	89.249±23.215	87.379±24.176	90.764±26.629
t		-8.159***	-6.756***	-7.541***	-7.560***

Note: * p < 0.05, ** p < 0.01, *** p < 0.001; "p" is the probability, reflecting the probability of an event.

According to the results presented in Table 1, there were no significant gender differences in physical exercise, body self-esteem, peer relationships, and prosocial behaviour (ps > 0.05). Nonetheless, male participants had higher average scores in these areas compared to females. Significant differences, however, were observed based on household registration (urban vs. rural) and whether participants were only children (ps < 0.001). Specifically, students from urban areas reported higher physical exercise levels, greater body self-esteem, better peer relationships, and increased prosocial behaviour. In contrast, only children exhibited lower levels of physical exercise, body self-esteem, and prosocial behaviour, and experienced poorer peer relationships.

Table 2

Correlation Analysis of Physical Exercise, Body Self-Esteem, Peer Relationships, Prosocial Behaviour, and BMI Index (N=952)

	1	2	3	4	5
1.Physical Exercise	1				
2.Body Self-Esteem	0.683***	1			
3.Peer Relationships	0.664***	0.946***	1		
4.Prosocial Behaviour	0.674***	0.958***	0.971***	1	
5.BMI	-0.463***	-0.606***	-0.596***	-0.614***	1

As shown in Table 2, physical exercise is positively correlated with body self-esteem, peer relationships, and prosocial behaviour (ps < 0.001), and negatively correlated with BMI (p < 0.001). These findings suggest that increased physical exercise is associated with higher body self-esteem, better peer relationships, greater prosocial behaviour, and a lower BMI. Similarly, body self-esteem is positively correlated with peer relationships and prosocial behaviour (ps < 0.001) and negatively correlated with BMI (p < 0.001), indicating that higher body self-esteem corresponds with improved peer relationships, increased prosocial behaviour, and a lower BMI. Peer relationships also positively correlate with prosocial behaviour (p < 0.001) and negatively with BMI, suggesting that better peer relationships are linked to greater prosocial behaviour and a lower BMI. Furthermore, prosocial behaviour shows a significant negative correlation with BMI, indicating that higher prosocial behaviour is associated with a lower BMI. However, it is important to note that the BMI values in this study ranged from 18.33 to 32.30, with a mean of 22.61 and a standard deviation of 2.19, falling within the normal weight range according to Chinese standards (18.5-23.9). Thus, the applicability of these findings to populations outside this BMI range may be limited.

Table 3

Mediating Effect Analysis & Model Fitting (N=952)

Dependent Variable	Independent Variable	R^2	F	β	t	p
PB	PE	0.958	7253.2274***	0.016	1.741	0.082
	BE			0.364	-17.266	0.000
	PR			0.617	29.988	0.000
BE	PE	0.467	831.104***	0.683	-28.829	0.000
PR	PE	0.440	747.215***	0.664	27.335	0.000

Abbreviation: PB, Prosocial Behaviour; PE, Physical Exercises; BE, Body Esteem; PR, Peer Relationship

Table 4

Significance Test of Mediating Effect (N=952)

	Effect	Bootstrap SE	Bootstrap 95% CI	
			Low	High
Direct Effect: PE→PB	0.021	0.012	-0.003	0.045
PE→BE→PB	0.332	0.045	0.255	0.434
PE→PR→PB	0.547	0.056	0.430	0.648
Total Indirect Effect	0.879	0.035	0.813	0.952

Abbreviation: PB, Prosocial Behaviour; PE, Physical Exercises; BE, Body Esteem; PR, Peer Relationship

The parallel multiple mediation effects of body self-esteem and peer relationships on the relationship between physical exercise and prosocial behaviour were assessed using Hayes' SPSS macro-PROCESS, specifically Model 4. The analysis involved 5000 bootstrapping samples to establish a 95% CI and evaluate the mediation effects. Table 3 reveals that most pathways in the model were statistically significant. Both body self-esteem and peer relationships significantly influenced prosocial behaviour (ps < 0.001), indicating that higher levels of body self-esteem and improved peer relationships are associated with increased prosocial behaviour. Additionally, physical exercise significantly affected both body self-esteem and peer relationships (ps < 0.001), suggesting that greater physical activity is linked to higher body self-esteem and better peer relationships. However, the direct path from physical exercise to prosocial behaviour was not statistically significant (ps > 0.05), indicating that, within this model, physical exercise did not have a direct effect on prosocial behaviour

From Table 4, analysis indicated that the direct effect of physical exercise on prosocial behaviour had a value of 0.021; however, a confidence interval comprising -0.003 and 0.045 encompasses zero, hence not significant. Conversely, the indirect effect of physical exercise on prosocial behaviour was 0.879 with the confidence interval comprised of 0.813 to 0.952, excluding zero, hence statistically significant. Further analysis indicates that body self-esteem mediates the relationship with an effect value of 0.332 and a confidence interval of [0.255, 0.434], while peer relationships mediate with an effect value of 0.547 and a confidence interval of [0.430, 0.648]. Both are statistically significant; thus, it can be established that body self-esteem and peer relationships fully act as mediators in influencing prosocial behaviour with physical exercise. SPSS regression analysis was conducted to see the moderating effect of BMI between physical exercise and body self-esteem. Data were standardized and an interaction term was added: physical exercise × BMI. The interaction term reached significance: β = 0.223, t = 10.648, p < 0.001, indicating that the role of BMI as a moderator was very important. Figure 2 presents the conceptual model of the mechanism of this influence.

Table 5

Moderating Effect of BMI on the Relationship between Physical Exercise and Body Self-Esteem (N=952)

Models and Variables	Subjective Well-being					
	Model 1		Model 2		Model 3	
	β	*t*	*β*	*t*	*β*	*t*
Physical Exercise	0.683	28.829***	0.512	21.422***	0.551	24.071***
BMI			-0.369	-15.450***	-0.297	-12.561***
Physical Exercise × BMI					0.223	10.648***
R^2	0.467		0.574		0.619	
ΔR^2	0.466		0.573		0.618	
F	831.104***		638.874***		514.150***	

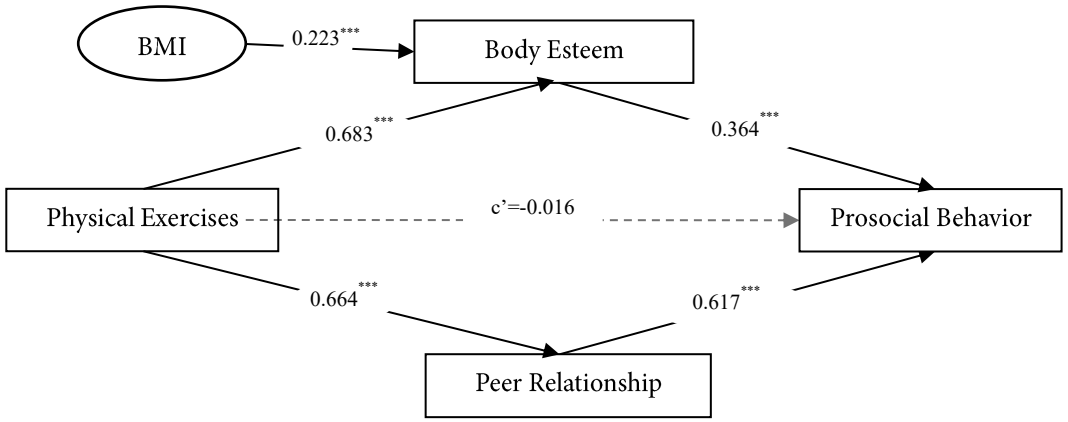

Figure 2: Multiple Mediation Model of the Effect of Physical Exercise on Prosocial Behaviour.

Discussion

This study took advantage of the questionnaire survey method to explore how physical exercise influences prosocial behavior and focused on parallel mediations from body self-esteem and peer relationships, and moderating effects of BMI on the relationship between physical exercise and body self-esteem to determine the

above-mentioned mechanisms for establishing a complete model. Independent samples t-tests did not show any significant gender differences regarding physical exercise, body self-esteem, peer relationships, and prosocial behavior, which confirms previous results (Buhrmester et al., 1988; Caprara & Zimbardo, 2004; Corder et al., 2016; Hausenblas, Carron, & Mack, 2008; Sabiston et al., 2009). Despite some findings suggesting females may have more negative body image (Tiggemann & Slater, 2014) and establish closer friendships (Rose & Rudolph, 2006), and other research indicating higher empathy in females (Eisenberg & Lennon, 1983), these differences were not significant in this study. These findings indicate that although gender may exert some influence on these variables, its overall impact appears to be minimal within adolescent populations or in contexts similar to the one studied. Significant differences were observed based on participants' household registration and whether they were only children. Students from urban areas and those with siblings reported higher levels of physical exercise, body self-esteem, peer relationships, and prosocial behaviour. Additionally, higher body self-esteem correlated with better peer relationships and greater prosocial behaviour, aligning with previous research findings.

A negative correlation was found between BMI and various variables. Liang and Miao (2022) investigated the effects of PBF on body self-esteem among university students, revealing that variations in PBF levels corresponded to differences in body self-esteem. Their study also highlighted that BMI, waist-hip ratio (WHR), and PBF are common indicators for evaluating body shape in academic research, with BMI being favoured in public health due to its simplicity and minimal data error. This study utilized BMI to assess its moderating role in the relationship between physical exercise and body self-esteem. Managing BMI effectively can enhance the benefits of physical exercise on body self-esteem. Extensive research has explored the interplay between physical exercise, body self-esteem, and peer relationships (Qin & Qin, 2023; Wei, 2022; Xiang & Jing, 2023), with some studies also addressing the effects of physical exercise on prosocial behaviour (Weifeng & Guanlan, 2022). Building on this body of work, the present study integrates these variables into a comprehensive multiple mediation model to examine the effect of physical exercise on prosocial behaviour. Such models are valuable for advancing theoretical frameworks by elucidating the mechanisms and pathways through which physical exercise influences prosocial behaviour. They also aid in identifying potential intervention targets, allowing researchers to focus resources on the most impactful aspects to achieve desired outcomes.

Analyses from the PROCESS revealed that the relationship between physical exercise and prosocial behaviour was fully mediated, in a parallel manner, by body self-esteem and peer relationships. The finding confirms the relationship between body self-esteem and prosocial behaviour and enriches the research about the influence of self-esteem on prosocial behaviour. It further verifies that physical exercise can enhance the prosocial behaviour of individuals through an improvement in either body self-esteem or peer relationships. By examining individual attributes with regard to prosocial behaviour and social characteristics, this study shows how physical exercise influences prosocial behaviour indirectly. It supports positive cognitive behaviours and builds a good social climate. These findings could be helpful to the educational institutions and policymakers in designing certain measures for intervention that are student specific. For instance, physical exercise could be promoted in schools by providing opportunities for physical activities and sports along with positive feedback and support measures that could help in enhancing the body self-esteem of students. The intervention that focuses on the provision of appropriate activities in a team environment, encouragement of good communication skills, teaching students how to establish good interpersonal relationships, and creating a positive peer environment that advocates for friendship, cooperation, and unity may positively affect students' prosocial behaviour. Based on these findings about the mediation model, consideration of comprehensive strategies of intervention might be warranted to better enhance the prosocial behaviour of students.

Conclusion

Physical exercise positively predicts prosocial behaviour; however, when body self-esteem and peer relationships are included in a multiple mediation model, the direct effect of physical exercise on prosocial behaviour becomes non-significant. Instead, physical exercise influences prosocial behaviour indirectly through its effects on body self-esteem and peer relationships, with both serving as parallel and complete mediators. Additionally, the moderating effect of the BMI index partially weakens the relationship between physical exercise and body self-esteem. These findings highlight the significant positive impact of physical exercise on physical and mental well-being, as well as on cognitive behaviours.

Suggestions

Physical exercise indirectly enhances prosocial behaviour, highlighting its societal importance. It is recommended that organizations, institutions, and schools increase physical activity frequency and maintain a healthy BMI. Promoting balanced physical and mental development

through expert-guided or well-designed activities can further enhance cognitive abilities while respecting individual autonomy. Though this study focused on college students, the benefits of physical activity are universal and adaptable for all age groups, contributing to overall societal development and harmony.

Prospect

The current research, which is based on cross-sectional data, suggests the need for future studies to employ longitudinal or experimental methods to better understand the causal relationships between physical exercise, body esteem, peer relationships, and prosocial behaviour. Tracking variables over time could clarify the stability and predictability of mediating effects. Additionally, expanding the sample to include diverse age groups, genders, and cultural backgrounds could reveal the universality and variability of these relationships. To enhance data reliability, future studies should consider using objective measurement tools, such as physical activity monitors or peer assessments, alongside self-report instruments.

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Appendix

1. How old are you?
2. What is your gender?
- ○ Male
- ○ Female

3. What is your household registration type?
- ○ Urban household registration
- ○ Rural household registration

4. Are you the only child in your family?
- ○ Yes
- ○ No

5. Your Academic Year:
- ○ Freshman (First Year)
- ○ Sophomore (Second Year)
- ○ Junior (Third Year)
- ○ Senior (Fourth Year)
- ○ Fifth Year (in some extended programs)
- ○ Graduate Year One (Master's Year One)
- ○ Graduate Year Two (Master's Year Two)
- ○ Graduate Year Three (Master's Year Three)

6. Your Major:
- ○ Humanities
- ○ Science
- ○ Engineering
- ○ Other

7. Your BMI (Body Mass Index): [Weight (kg) ÷ Height $(m)^2$]

Physical Activity Level Scale

8. How often do you engage in the above-mentioned physical activities in a month?
- ○ Less than once a month
- ○ 2 to 3 times a month
- ○ 1 to 2 times a week
- ○ 3 to 5 times a week
- ○ Approximately once daily

9. When participating in the above-mentioned physical activities, how many minutes do you spend per session?
- ○ Less than 10 minutes
- ○ 11 to 20 minutes
- ○ 21 to 30 minutes
- ○ 31 to 59 minutes
- ○ 60 minutes or more

10. How would you describe the intensity of your physical exercise?
- ○ Light exercise (e.g., walking, radio calisthenics, playing recreational ball games)
- ○ Low-intensity, less strenuous exercise (e.g., playing volleyball, table tennis, slow jogging, practicing tai chi)
- ○ Moderate-intensity, more vigorous and sustained exercise (e.g., cycling, running, playing table tennis)
- ○ High intensity, not sustained exercise with short bursts of breathlessness and heavy sweating (e.g., playing badminton, basketball, tennis, soccer)
- ○ High-intensity, sustained exercise with continuous breathlessness and heavy sweating (e.g., racing, full-body aerobics, swimming)

Physical Self-Perception Profile (PSPP)

11. Below are some sentences describing oneself. There are no right or wrong answers. Please choose the option that best represents you in each statement. Use the following scale:
Scale: (1) Completely Agree, (2) Mostly Agree, (3) Uncertain, (4) Mostly Disagree

Title/Options	1234
○ 1.When participating in physical activities, I consider myself excellent.	
○ 2.I feel very confident about my physical condition and health level.	
○ 3.Compared to others, I have an attractive and appealing body.	
○ 4.I believe my body is stronger than most people of the same gender.	
○ 5.I am satisfied with my body shape and abilities.	
○ 6.When it comes to athletic abilities, I belong to the most outstanding group.	
○ 7.I am confident that I can engage in physical exercises regularly.	
○ 8.I find it easy to maintain an attractive physique.	
○ 9.I run faster than most people.	
○ 10.I am very satisfied with my physical condition and health.	
○ 11.I always feel very confident when participating in physical activities.	
○ 12.Compared to most people, I have better energy and physical strength.	
○ 13.I feel quite comfortable when I wear revealing clothing.	
○ 14.I have confidence in my speed.	
○ 15.I am very confident in my physical abilities.	
○ 16.When participating in sports events, I am always the most outstanding.	
○ 17.I always feel relaxed and confident in a fitness and exercise environment.	
○ 18.Others envy my exceptional physique.	
○ 19.When it comes to physical strength, I am always very confident.	
○ 20.I always have a positive attitude towards my body.	
○ 21.I am the first to learn new movements.	
○ 22.I am capable of maintaining regular physical exercises and physical health.	
○ 23.Compared to most people, my body shape is the best.	
○ 24.Compared to most people of the same gender, my explosive power is very good.	
○ 25.I always take extra care of my body.	
○ 26.Whenever there is an opportunity, I am always the first to participate in sports events.	
○ 27.Compared to most people, I always maintain a high level of physical health.	
○ 28.I have great confidence in my body.	
○ 29.In situations that require physical strength, I feel the most outstanding.	
○ 30.I am very satisfied with my physical condition.	

Peer Relationship Scale

12. Below are some sentences describing oneself. There are no right or wrong answers. Please choose the option that best represents you in each statement.
Scale:(1) Never, (2) Rarely, (3) Uncertain, (4) Mostly, (5) Always

Title/Options:	12345
○ 1.We share common views and ideas and have good understanding between each other.	
○ 2.My close friend(s) and I have similar interests and perspectives.	
○ 3.When facing difficulties, we confront them together.	
○ 4.We have many things in common and can easily communicate with each other.	
○ 5.Our personalities are similar.	
○ 6.We are honest with each other and can speak openly.	
○ 7.We help each other.	
○ 8.We understand and consider each other's feelings.	
○ 9.We get along well together.	

○	10.We may have conflicts, but we understand each other.
○	11.After a disagreement, we quickly reconcile.
○	12.Even with conflicts, we communicate well and tolerate each other.
○	13.My close friend is very understanding.
○	14.My close friend is accepting of me.
○	15.We get along well together.
○	16.We have been together for a long time.
○	17.We are inseparable.
○	18.We train and play together.
○	19.Training with my close friend(s) is enjoyable.
○	20.During training and competitions, we encourage each other.
○	21.When I encounter difficulties, my close friend(s) comfort me.
○	22.We care about each other.
○	23.During training, my close friend(s) practice with me.
○	24.We face training difficulties together.
○	25.We discuss and solve training or competition problems together.

Prosocial Behavior Scale

Below are some sentences describing oneself. There are no right or wrong answers. Please choose the option that best represents you in each statement.

Scale:(1) Not at all like me, (2) Somewhat unlike me, (3) Neutral/Undecided, (4) Somewhat like me, (5) Very much like me.

	Title/Options:	**12345**
○	1.When someone is present, I do my best to help others.	
○	2.I feel very good when I can comfort someone who is feeling down.	
○	3.I rarely refuse when someone asks for my help.	
○	4.I am more willing to help others when there are people watching.	
○	5.I tend to help those who are truly in trouble or urgently need assistance.	
○	6.I am more willing to help others in many public situations.	
○	7.When someone asks for my help, I will not hesitate to assist them.	
○	8.I prefer to donate anonymously.	
○	9.I tend to help those who are seriously injured or ill.	
○	10.I donate money or items without expecting personal benefits in return.	
○	11.When someone asks for my help, I quickly put aside what I am doing to assist them.	
○	12.I tend to help those in need without seeking recognition.	
○	13.I tend to help others, especially when they are emotionally upset.	
○	14.I do my best to help others when someone is watching.	
○	15.When others are in difficult situations, I naturally offer help.	
○	16.In most cases, I help others without seeking recognition.	
○	17.I help others, investing time and effort, without expecting much in return.	
○	18.When others are emotionally upset, I am more likely to do my best to help them.	
○	19.When someone asks for my help, I never procrastinate.	
○	20.I believe that providing help when the recipient is unaware is best.	
○	21.When my emotions are touched, I am more inclined to help those in need.	
○	22.I often make donations without others knowing, which makes me feel good.	
○	23.I help others without expecting corresponding returns in the future.	
○	24.When someone asks for my help, I do everything in my power to assist them.	
○	25.I frequently help others even if I gain nothing from it.	
○	26.When someone is in a bad mood, I often help them.	