

The Effect of Physical Exercise Psychology on Behaviour Control of College Students

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Abstract

Within the demographic of college students, characterized by elevated educational attainment and self-regard, there typically exists a propensity towards heightened ambitions compared to their non-academic peers. However, this cohort also contends with escalated psychological strain due to intensified competition within their academic spheres. This study sought to elucidate the impact of physical exercise psychology on the behavioural regulation of college students amidst these demanding circumstances. A sample comprising 170 college students enrolled in a conventional university was selected via random sampling methodology. A total of 170 questionnaires were distributed, achieving a complete recovery rate of 100%. Notably, no instances of invalid questionnaires, characterized by incorrect or incomplete responses, were encountered, resulting in a 100% questionnaire effectiveness rate. Subsequently, participants completed the administered questionnaires and engaged in experimental protocols designed to assess levels of exercise intention, executive function, and other pertinent variables. The outcomes of a multiple regression analysis revealed that exercise attitude, subjective norms, and behavioural control collectively elucidated 70% of the variance in exercise intention. Furthermore, exercise intention and the perception of behavioural control explicated 37% of the behavioural variance. For instance, college students, in contrast to their counterparts, exhibit pronounced autonomy and possess a heightened comprehension of the advantages of exercise, coupled with proficient mastery of exercise techniques. Consequently, within the context of college students, the theory of planned behaviour assumes a prominent role in forecasting both intention and subsequent behaviour. The psychological well-being of college students not only impacts their academic performance and campus life but also exerts a direct influence on their long-term personal development. To foster the mental health advancement of college students, it is imperative for society, educational institutions, and families to allocate considerable attention and resources. This study further enriches the existing body of literature by providing comprehensive insights that may serve as a valuable resource for researchers seeking to delve into novel avenues of inquiry within the realm of physical exercise psychology and its implications for behavioural regulation among students.

Keywords: Physical Exercise, Psychology, Behaviour Control, College Student Behaviour.

Introduction

College students, characterized by elevated cultural refinement and self-regard, typically harbour aspirations and pursuits distinct from their peers. However, intensified competition within academic realms imposes heightened psychological pressures upon them, engendering concerns about their mental well-being (Cielo, Ulberg, & Di Giacomo, 2021). Recent trends underscore a surge in mental health issues among college students, manifesting in illnesses, suicides, and societal disruptions, thereby obstructing their developmental trajectory (van Hooft & Kreemers, 2022). Addressing the imperative to mitigate or alleviate the psychological stress, crises, and barriers arising from such pressures has become an urgent concern. Consequently, there is a pressing need to bolster mental health education among college students to pre-empt mental disorders and

psychosomatic ailments, fostering psychosomatic well-being and equipping them with resilience to navigate contemporary social dynamics with a positive mental outlook.

Engagement in physical exercise not only enhances physical fitness but also serves as a conduit for alleviating academic stress, channelling subconscious impulses, mitigating ennui, bolstering self-assurance and achievement, facilitating interpersonal interactions, and fostering character development and willpower (Hausenblas & Rhodes, 2016). Research from the University of California underscores the profound benefits of regular physical activity in attenuating nervous tension, enhancing self-perception, mitigating depression, and serving as a pivotal strategy for mental health maintenance, promotion, and amelioration (Zhao & Bai, 2022). This multifaceted approach is illustrated in Figure 1, delineating its role in regulating college students' behaviour.

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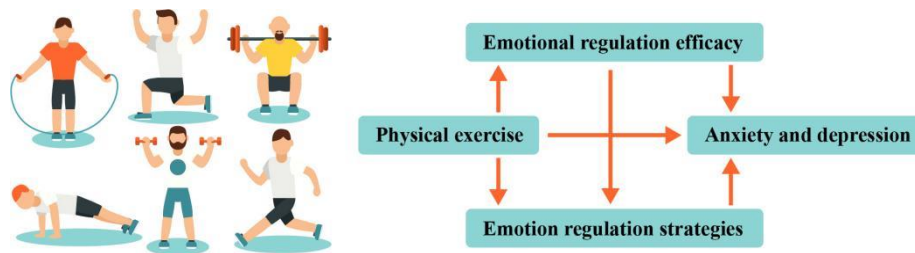


Figure 1. Behaviour Control of College Students.

The Psychological Effect of Physical Exercise

(1) Moderate Physical Exercise

Physical exercise encompasses the interplay of bodily engagement, technical proficiency, and skill acquisition, while concurrently engendering emotional gratification and achievement (Fernandes et al., 2018). Emotion serves as a pivotal indicator of mental well-being, with students' behaviours, expressions, and volition during exercise serving as authentic reflections of their psychological states (Ren, Li, & Zhang, 2021). Educators possess the capacity to discern variations in students' mental health through their participation in physical activities.

Engagement in sports during periods of adversity can serve as a mitigating factor for certain psychological disorders, providing avenues for the release of tension, sadness, anxiety, and other negative emotions, thereby fostering feelings of relaxation and contentment (Hove, Martinez, & Shorrock, 2022). This therapeutic effect can be attributed to the redirection of excitatory centres within the cerebral cortex during physical exertion, resulting in the inhibition of pain centre excitability. Consequently, individuals become absorbed in the physical movements, thereby temporally displacing negative moods and facilitating attentional redirection, thereby promoting beneficial regulatory effects on brain activity.

(2) Make Use of the Features of Sports to Promote Mental Health

Regular participation in group exercise projects can facilitate a gradual transition from solitary tendencies to adeptness in peer communication among students. Engagement in various sports such as swimming, skating, parallel bars, and long-distance running instils in students the capacity to confront and surmount athletic challenges with fortitude and fearlessness, fostering the dissolution of psychological barriers such as shyness, timidity, and inferiority (Liu, 2022). Similarly, involvement in activities such as table tennis, tennis, badminton, hurdle jumping, high jump, and long jump can empower students to overcome psychological hesitancy, indecision, and equivocation, thereby cultivating resilience and decisiveness (Liu, 2022). Furthermore, participation in

sports like chess, Taijiquan, and Qigong offers benefits in neural regulation, augmenting cognitive control and mitigating tendencies toward impatience and impulsivity (Wang & Park, 2021).

(3) Improve the Ability of Emotional Adjustment and Psychological Endurance in Physical Exercise

Harnessing the influential capacity of physical exercise to enhance mental well-being has been underscored in previous research (Faulkner & Biddle, 2002). Survey findings corroborate that increased interaction among students and between students and teachers during physical activities facilitates mutual understanding. Greater frequency and duration of interactions foster shared experiences and sentiments (Fortes & Lindau, 2022). Group-based physical exercises inherently entail collaboration and interpersonal engagement, thus facilitating the adjustment of intricate interpersonal dynamics within and between individuals and groups. Throughout collective exercise endeavours, students not only exert themselves physically to acquire and master athletic techniques and skills but also benefit from the camaraderie, support, respect, trust, and solidarity fostered within the group. Through sustained dedication, students not only refine their athletic prowess and cultivate resilience but also develop empathy and understanding, thereby reaping both psychological and physical rewards.

(4) Take An Active Part in Various Sports Competitions

Sports competition epitomizes principles of equitable rivalry and the triumph of the most adept (Renson, 2009). As a distinctive form of physical activity, sports competition adheres to universally recognized regulations and norms, facilitating the exploration and transcendence of personal limits through comparative assessments of physical (including mental) prowess. The vicissitudes encountered during competitive endeavours offer an outlet for suppressed desires for validation and achievement. Consequently, students engage in a process that not only addresses their spiritual yearnings but also enables them to discern the intrinsic value of existence, the significance of continual growth, and pursuits beyond mere survival, thereby fulfilling individual needs for

empowerment, social interaction, competitive engagement, and personal development. Sporting engagements afford opportunities for the cathartic release of various negative emotions, particularly enabling the redirection of impulses following setbacks. Through such redirection, sports facilitate the dissolution of emotional barriers, offering avenues for the alleviation and management of certain mental afflictions, while concurrently fostering resilience and fortitude in confronting life's challenges.

(5) Improve the Adaptability of College Students

Fundamentally, sports represent a fundamental mode of physical activity (Jones, Holloway, & Brown, 2012). A diverse array of physical exercises constitutes a synthesis of human ingenuity, labour expertise, and military strategies, transcending mere functional utility to embody elements of cultural and societal significance (Lowe & ÓLaighin, 2014; Wang, Yang, & Dong, 2017). Mastery of physical exercises among college students is pivotal for enhancing their life skills and self-assurance, thereby facilitating adaptation to societal demands, with potential implications extending to their overall life trajectory (Ji & Zheng, 2021). Consciously and actively engaging in physical exercises is imperative within physical education curricula, not only to enhance physical fitness but also to fulfil prescribed standards, embodying a paradigm of self-discipline with ancillary benefits extending to academic pursuits (Chen et al., 2022).

Foremost among the distinctive attributes of sports are active individual engagement and frequent interpersonal interaction. Within diverse school sports activities, competitions, and instructional settings, college students encounter myriad opportunities for social interaction, acquiring essential communication skills and practical experiences that expedite adaptation to academic and societal contexts, thereby laying a robust foundation for future endeavours.

(6) Improve the Psychological Endurance of College Students

Sports are distinguished by their inherent challenges, rigor, intensity, adversarial encounters, and robust competitive dynamics (Mellalieu, Hanton, & O'Brien, 2004). Engaging in sports and sporting competitions impels college students to continuously exert their willpower and mental resilience, fostering experiential insights into life philosophies and augmenting their psychological adaptability (Wang & Park, 2021). Participation in sports invariably elicits profound emotional responses and demands conspicuous displays of willpower, thereby not only fostering a resilient disposition characterized by perseverance and fortitude in confronting challenges but

also nurturing psychological resilience through the vicissitudes of victory and defeat in competitive settings. Cultivating a capacity for self-regulation and mental resilience serves as a cornerstone for ensuring mental well-being and represents a paramount strategy for sustaining holistic physical and psychological health.

(7) Cultivate College Students' Consciousness of Code of Conduct

Normative education stands as a crucial facet of adolescent socialization preceding their integration into society. Sports serve as arenas for normative education, offering individuals opportunities to engage in simulated scenarios conducive to practicing social norms. Every sporting endeavour unfolds within prescribed rules and norms, necessitating the establishment of clear and unequivocal codes of conduct, which serve as fundamental prerequisites for all sporting activities and their continuity. Physical education encompasses structured classroom protocols, pedagogical requirements, examination standards, as well as competition regulations, athlete conduct guidelines, and ethical principles governing sports competitions. The implementation of clear rules and codes of conduct within sporting events ensures fairness and equity, akin to the emulation of learning social laws and ethics. This process aids in comprehending the societal significance and imperative of adhering to social norms, fostering a mindset that values rights, mutual respect, and collaborative engagement. Such simulated practices yield tangible social benefits with discernible impacts on societal dynamics.

The Main Way to Promote the Mental Health of College Students

The objective of mental health education entails systematically fostering and enhancing students' mental acuity and well-being through deliberate and structured means. This process aims to continuously refine students' mental faculties while providing targeted assistance for addressing any challenges pertaining to their mental well-being or mental health issues, thereby facilitating their rehabilitation.

(1) Through deliberate and systematic mental health education efforts, physical education serves as a crucial conduit and instrument for the implementation of mental health education, exerting a distinct influence in assisting students to alleviate psychological distress, enhance their psychological well-being, rectify psychological deficiencies, surmount psychological hurdles, and enhance psychological resilience (Wang, Zhou, et al., 2022). Physical education instructors should prioritize mental health education content over physiological health education for college

students (Zhang, 2022). By purposefully uncovering the value of mental health within physical education textbooks, educators can offer specialized support for students grappling with issues related to mental acuity or mental health, thereby facilitating their comprehension of mental health standards, understanding of the factors influencing mental well-being, and recognition of mental health as a pivotal objective of physical exercise. This approach empowers students to acquire strategies for mental health maintenance and enhances their self-regulation and coping abilities.

(2) Improve the mental health education level of college physical education teachers

As the reform of school physical education progresses and physical health courses are implemented, the effective execution of mental health education within college physical education hinges significantly on the competence of physical education instructors, encompassing their proficiency in mental health and knowledge in this domain. It is foreseeable that inadequacies in the mental health and psychological knowledge of physical education instructors may detrimentally impact the mental well-being of college students, as they may lack the requisite expertise to offer appropriate guidance on mental health matters. Therefore, the cultivation of high-quality physical education instructors with robust mental health qualities assumes paramount importance in ensuring the efficacy of mental health education in college settings.

(3) Organize and guide students to participate in sports activities actively

College students are encouraged to actively engage in various school sports initiatives, which encompass participation in physical education classes, morning exercises, recess activities, and extracurricular sports pursuits. Consistent involvement in morning exercises fosters a habit of regular physical activity, ensuring optimal energy levels for daily academic endeavours. Utilizing recess periods for light physical activities on the sports field serves to alleviate psychological stress and mitigate negative emotions arising from classroom settings, thereby reducing both mental and physical fatigue. Additionally, participation in extracurricular sports, such as sports club training and competitions, as well as organized class sports activities, offers opportunities to acquire and hone sports skills. This not only enhances physical fitness but also instills a lifelong appreciation for exercise. Furthermore, engagement in various forms of competitions provides students with avenues to interact beyond campus boundaries, facilitating enhanced communication skills and fostering inner satisfaction through experiences of happiness, success, and camaraderie.

The study aimed to explore the impact of physical exercise psychology on college students' behavioural control. 170 students from normal universities participated, yielding a 100% response rate. Questionnaires and experimental procedures were used to assess motor intention, executive function, and other variables. Regular physical exercise has been recognized by researchers as beneficial for relaxation, self-awareness improvement, and alleviating depression. The study is structured into literature review, methodology, data analysis and results, and discussion with future recommendation.

Literature Review

Physical exercise serves not only as a means to enhance physical health but also as an effective strategy in preventing and mitigating depression (Penedo & Dahn, 2005). Research findings suggest an inverse relationship between physical exercise and the severity of depression: non-participation in physical exercise correlates with higher levels of depression, occasional exercise with elevated depression levels, and regular exercise with reduced depression levels. Thus, physical exercise demonstrates potential efficacy in counteracting depression, although its consistency in achieving therapeutic outcomes warrants further investigation. While exercise therapy may pose challenges in treating mild depression, its efficacy remains inconclusive for major depression, necessitating reliance on conventional treatment modalities such as pharmaceutical interventions, electroconvulsive therapy, psychotherapy, or their combinations.

Depression, characterized by profound and enduring negative affect, is alleviated by engaging in suitable physical exercise, which enhances bodily metabolism, generating excitement and a sense of gratification. Active participation in physical activities like basketball, football, and volleyball fosters social interaction and cooperation, aiding in the alleviation of social anxiety among depressed individuals (Arsović, Đurović, & Rakočević, 2020). Strengthening mental health education among college students is imperative for averting mental disorders and psychosomatic ailments, fostering psychosomatic health, and facilitating positive adaptation to societal exigencies.

Moreover, recent empirical studies have explored the relationship between physical exercise and negative emotions, particularly during the COVID-19 pandemic, highlighting the mediating role of psychological resilience. Findings underscore a negative association between physical exercise and negative mood among college

students, with physical exercise positively correlated with psychological resilience (Li, Yu, & Yang, 2021). Additionally, interventions incorporating health and fitness theory alongside running/jumping activities or small ball sports have demonstrated positive effects on students' physical fitness, knowledge, interest, and attitude toward health and fitness (Volk et al., 2021).

Recognizing the significant impact of physical activities on mental health, schools are increasingly integrating mental health education into physical education curricula. This holistic approach acknowledges the reciprocal relationship between physical and mental well-being, emphasizing the importance of fostering both physical and psychological resilience. By leveraging the guidance of educators, physical education can serve as a conduit for students to enhance their physical fitness while nurturing their psychological well-being, ultimately contributing to their overall development. These studies collectively underscore the profound influence of physical exercise psychology on the behavioural control of college students, thereby laying the groundwork for several research hypotheses.

H1: *Subjective norm has significant and positive impact on exercise intention.*

H2: *Behaviour attitude has significant and positive impact on exercise intention.*

H3: *Sense of behavioural control has significant and positive impact on exercise intention.*

H4: *Exercise intention has significant and positive impact on exercise behaviour.*

H5: *Sense of behavioural control has significant and positive impact on exercise behaviour.*

Methodology

The researcher employed an experimental research design and conducted a literature review using various databases. Utilizing the China National Knowledge Network, 76 relevant studies were retrieved using keywords such as "behavioural control theory" and "physical exercise." Furthermore, by employing keywords including "behavioural control theory," "exercise intention," and "behaviour," 20 additional studies were identified. A comprehensive search on Baidu Academic yielded a total of 16,250 literature sources with keywords such as "intention-behaviour," "TPB," and "physical exercise." Thorough examination of the retrieved literature facilitated a comprehensive understanding of the current research landscape and future trends in both domestic and international contexts. These insights served as crucial theoretical foundations for shaping the

research program and methodological selection (Wang, Chen, et al., 2022).

Executive function encompasses inhibition, behaviour, and exercise as sub-functions, each requiring specific measurement paradigms. In this study, the Flanker task assessed suppression ability, the 2-back task evaluated refresh ability, and the more-odd shifting task measured conversion ability. Testing was conducted in a controlled and quiet environment, utilizing test programs programmed via the E-prime 2.0 system and administered on computers. Given that reaction time served as the primary evaluation index for each function, subjects were instructed to respond promptly while maintaining accuracy during the testing process.

Research Instrument

The constructs of exercise intention, exercise attitude, subjective norm, and sense of behavioural control were assessed utilizing the Planned Behaviour Theory Scale. The exercise behaviour of college students was evaluated using the Physical Activity Rating Scale.

Measurement of Exercise Behaviour

The Physical Activity Rating Scale (PARS-3) was employed to assess the exercise levels of college students, thereby gauging their exercise behaviour. This scale, developed by Liang Deqing et al., utilizes a 5-point Likert scale to measure exercise intensity, duration, and frequency. The exercise amount is computed using the formula: exercise amount = exercise intensity × (duration - 1) × exercise frequency. Based on the calculated exercise amount, participants were categorized into three groups: those with a score of ≤19 were classified as engaging in low exercise levels, scores ranging from 20 to 42 represented moderate exercise levels, while scores ≥43 indicated high exercise levels. The scale demonstrates satisfactory reliability and validity and is widely employed in the field of exercise psychology.

Measurement of Executive Function

The assessment of the three sub-functions comprising the executive function was conducted using a computer with a screen size of 15.6 inches and a resolution of 1920x1080. All experimental tasks were programmed utilizing the E-prime 2.0 system. The tasks were tailored as per the following specifications:

Flanker Task Measurement Suppression Function

During an experimental task, a sequence of letters containing "F" and "L" is displayed at the centre of the computer screen. Two types of stimuli are presented: (1) Inconsistent sequences, such as "FFLFF" and "LLFLL";

(2) Consistent sequences, such as "FFFFFF" and "LLLLL". Participants are instructed to promptly respond to the letter sequence. If the middle letter is "F", they are required to press the "F" key, while if the middle letter is "L", they must press the "L" key. Each participant is tasked with completing 72 responses, divided equally between consistent and inconsistent sequences (36 responses each). In each trial, a fixation point "+" is displayed in the middle of the screen for 500ms, followed by the presentation of the stimulus for 1000ms. The Stimulus Onset Asynchrony (SOA) after the keystroke response is set to 1000ms. Prior to the formal test, participants are given instructions and required to practice. A total of 12 practice responses are provided, with the system providing feedback (e.g., "correct", "incorrect", or "late") after each response. Following the practice round, participants can proceed to the formal test by pressing the space bar, or opt to practice again by pressing "Q" until they are familiar with the experimental requirements. However, to mitigate potential practice effects and experimental errors due to physical fatigue resulting from prolonged practice, the formal test is conducted only after participants understand the experimental procedures and master the operational methods. Prolonged practice is discouraged. The inhibitory function is assessed by calculating the difference between the mean response time and the response time elicited by the inconsistent condition. A smaller difference indicates better inhibitory ability (Einstein, Katz, & Ben-Hur, 2022).

Data Collection Procedure

The participants in this study consisted of college students selected through random sampling from a normal university, totalling 170 subjects. Questionnaires were administered, and experiments conducted to assess variables including exercise intention and executive function. The research procedure was supervised and directed by the researcher, with clear instructions provided for operation and technique. Subjects were required to complete the questionnaire on-site to ensure the validity and reliability of the experimental data. Out of the 170 questionnaires distributed, all were retrieved, resulting in a 100% recovery rate. Additionally, the survey's effectiveness rate was 100%, with no instances of incomplete or incorrectly filled-out questions. Of the 170 participants, executive function was evaluated, with reaction time serving as the assessment index. To maintain data integrity, sample data with an accuracy lower than 75% were excluded, leaving 150 valid sample data, resulting in an effective

rate of 94.7%. Among the participants, 70 were male students (aged 18.80 ± 1.02) and 80 were female students (aged 18.20 ± 0.82).

The study comprised two stages: In Stage 1, exercise intention, exercise attitude, subjective norm, sense of behavioural control, and executive function were measured using the Planned Behaviour Theory Scale and programmed experimental paradigm. Phase 1 measurements were conducted from October 8, 2020, to November 17, 2020, lasting for 40 days. In Stage 2, conducted four weeks after Stage 1, subjects completed the Physical Activity Rating Scale to assess exercise behaviour. Phase 2 measurements lasted from November 5, 2020, to December 15, 2020, also spanning 40 days. The entire test duration was 68 days. Following data collection, Excel, SPSS, and other software were employed for data sorting, analysis, and obtaining research results (Mubaroq, Abdullah, & Setiawan, 2021).

Data collation and analysis were conducted using Excel 2013, SPSS 22.0, and Amos 24.0. Initially, data was inputted into Excel for preliminary sorting and analysis. Subsequently, SPSS software was utilized to perform descriptive statistics, t-tests, correlation analyses, regression analyses, and tests for moderating effects. Amos was employed to construct structural equation models and evaluate the path coefficients and fit indices of the planned behaviour theory (Meng et al., 2022).

Results and Discussion

Descriptive Statistics of Each Research Variable

The statistical analysis of college students' executive function and behaviour control theory is presented in Table 1. The scores for inhibition, behaviour, and exercise function were 10.03 ± 17.16 , 993.76 ± 200.45 , and 360.39 ± 110.36 , respectively. Male students' scores were slightly lower than those of female students, suggesting a slightly better executive function among boys, though the difference was not significant ($p > 0.05$). However, scores across all dimensions of exercise function theory were generally higher. While male students exhibited slightly higher scores in behavioural attitude, subjective norm, and exercise intention compared to female students, these differences were not significant ($p > 0.05$). Notably, there were significant gender differences in sense of behavioural control ($t = -2.35$, $p < 0.05$) and exercise behaviour ($t = -3.15$, $p < 0.01$), with boys scoring significantly higher than girls (Akgun et al., 2022).

Table 1

Statistical Mean Value and Standard Deviation of Study Variables Gender Difference

Variables	Full Sample (N=N=160)	Male Students (N=75)	Female Students (N=85)	T
Inhibitory Behaviour	10.03±17.16	11.04±20.58	12.05±22.48	0.08
Exercise Function	993.76±200.45	994.75±194.23	1019.65±201.87	0.84
Subjective Norm	360.39±110.36	362.35±115.62	370.81±106.52	1.12
Behaviour Control	4.75±0.98	4.85±0.97	4.74±1.47	-1.36
Exercise Intention	4.38±0.85	4.63±0.36	4.25±0.78	-2.36
Exercise Intention	4.62±1.24	4.72±1.15	4.24±1.03	-1.71
Exercise Behaviour	21.23±16.75	36.24±17.12	36.24±13.75	-3.18

Descriptive Statistics of Each Research Variable

(1) Correlation Between Variables of Behavioural Control Theory and Exercise Behaviour

The correlation analysis was conducted for each factor of behaviour control theory, and the findings are summarized in Table 2. It was observed that exercise intention exhibited positive correlations with subjective norms, exercise attitude, and sense of behavioural control, with correlation coefficients of 0.58 (p < 0.01), 0.76 (p < 0.01), and 0.74 (p < 0.01), respectively. Additionally, exercise intention and behavioural control demonstrated positive correlations with exercise behaviour, with correlation coefficients of 0.56 (p < 0.01) and 0.54 (p < 0.01), respectively.

Table 2

Correlation Matrix of Each Factor in Planning Behaviour Theory

Variables	1	2	3	4	5
Exercise Intention	1				
Subjective Norm	0.58	1			
Exercise Attitude	0.76	0.66	1		
Sense Of Behavioural Control	0.74	0.44	0.68	1	
Exercise Behaviour	0.56	0.38	0.48	0.55	1

(2) Each Variable's Direct Influence on Exercise Intention and Behaviour

To explore the direct predictive influence of relevant factors on exercise intention and behaviour, multiple regression analysis (see Table 3) was conducted. The findings indicated that subjective norms (β = 0.16, p < 0.01), exercise attitude (β = 0.43, p < 0.01), and behavioural control (β = 0.36, p < 0.01) significantly predicted exercise intention, collectively explaining 70% of its variance (F = 119.9, p < 0.01). Notably, behavioural control and exercise attitude emerged as robust predictors of exercise intention, while subjective norms exhibited relatively weaker predictive power.

Furthermore, exercise intention and behavioural control emerged as pivotal predictors of exercise behaviour. Exercise intention exhibited a stronger influence on

behaviour (β = 0.39, p < 0.01) compared to behavioural control (β = 0.26, p < 0.01). Together, these factors accounted for 37% of the variance in exercise behaviour (F = 45.41, p < 0.01), leaving more than 60% of exercise behaviour variance unexplained (Okamoto et al., 2021).

Table 3

Multiple Regression Analysis of Exercise Intention and Behaviour

Dependent Variable	Independent Variable	B	B	R ²
Exercise Intention	Subjective Norm	0.190.18		0.8
	Behaviour Attitude	0.520.45		
	Sense Of Behavioural Control	0.450.38		
Exercise Behaviour	Exercise Intention	1.820.38		0.38
	Sense Of Behavioural Control	1.440.28		

Analysis on the Direct Prediction Effect of Related Factors on Intention and Behaviour

Through multiple regression analysis, it was determined that exercise attitude, subjective norms, and behavioural control are robust determinants of exercise intention (Kurashimo et al., 2021). Notably, the sense of behavioural control and exercise attitude exhibited greater influence, while subjective norms demonstrated comparatively weaker impact. Scholars from the University of California have emphasized the significant benefits of regular physical exercise, including stress reduction, enhanced self-awareness, and alleviation of depression, highlighting its pivotal role in maintaining and enhancing mental health while combating mental illness (Al-Jubari, Hassan, & Liñán, 2019). College students, characterized by high levels of self-determination and autonomy, tend to exhibit lower subjective norms regarding exercise engagement. Furthermore, exercise intention and the sense of behavioural control emerged as potent determinants of exercise behaviour, with exercise intention displaying stronger explanatory power compared to the sense of

behavioural control. The standardized regression coefficient for exercise intention was notably high at 0.39 ($p < 0.01$), aligning with the notion proposed by scholars that "intention is the best predictor of behaviour."

Moreover, the results of multiple regression analysis revealed that exercise attitude, subjective norms, and behavioural control collectively accounted for 80% of the variance in exercise intention, with exercise intention and the sense of behavioural control explaining 37% of the behavioural variance. However, a meta-analysis of 72 articles revealed that the theory of planned behaviour only explained 27% of the variance in exercise behaviour. This inconsistency can be attributed to several factors. Firstly, variations in sample groups may lead to differing attitudes towards exercise and levels of perceived behavioural control, as well as varying degrees of social pressure. For instance, college students often exhibit a strong sense of independence and possess greater insight into the benefits of exercise and proficiency in exercise skills, thereby elevating the predictive role of the theory of planned behaviour among this demographic. Secondly, discrepancies in measurement tools and methodologies across studies contribute to inconsistent findings, highlighting the need for standardized measurement tools and protocols in future research endeavours (Liu et al., 2022).

Discussion and Conclusion

Sports serve as a beneficial avenue for cultivating and enhancing interpersonal relationships (Nazarenko, 2013). In light of the rapid pace of modern life and the prevalence of single-child families among contemporary college students, there is a growing trend of self-centeredness and deficient interpersonal skills. Consequently, sports emerge as an optimal platform for fostering interpersonal communication. Sporting activities predominantly entail collective participation, necessitating cooperation, collaboration, and a collective spirit to achieve success (Zhong, Zhai, & Li, 2021). Engaging in sports cultivates a sense of camaraderie, satisfying individual needs for social interaction, enriching lifestyles, and serving as a means for students to alleviate academic and personal pressures, mitigate loneliness, and forge meaningful connections with like-minded peers. Thus, sports confer psychological benefits upon students and contribute to the formation and enhancement of interpersonal relationships.

Moreover, heightened awareness of mental health and the significant role of physical activity in promoting mental well-being underscore the increasing importance of physical education in mental health education within

schools. Recognizing the interdependence between physical and psychological health, educational institutions must integrate psychological education into physical education, aligning with contemporary educational imperatives. Emphasizing the pivotal role of educators in guiding students, physical education programs should prioritize both physical fitness and psychological well-being. Enhancing students' physical appearance not only improves physical fitness but also augments psychological health. Through positive experiences in physical exercise, individuals can transmute negative thoughts, emotions, and behaviours, fostering robust personalities and nurturing healthy psychological attributes, thereby enhancing students' social adaptability and transformative capacities.

Advocating for sports and promoting heart fitness through physical exercise are vital endeavours. Physical exercise not only promotes fitness but also fosters emotional well-being. Leveraging public opinion to encourage widespread participation in physical exercise, especially among college students, facilitates the cultivation of healthy exercise habits. Embracing the nationwide fitness initiative, governments should prioritize the construction of grassroots sports facilities and bolster university sports development. Fostering a conducive sports environment at the grassroots level naturally garners increased attention toward sports and physical exercise, thereby optimizing the emotional benefits derived from sports participation.

Implications and Future Directions

The outcomes of the investigation yield practical and theoretical implications that enrich the existing literature. Theoretically, the findings underscore the substantial influence of subjective norms, behavioural attitudes, and the sense of behavioural control on exercise intentions. Notably, subjective norms and behavioural attitudes exhibit higher standardized beta coefficients (β), signifying their enhanced predictive capacity for exercise intentions compared to the sense of behavioural control. This underscores the pivotal roles of social influences and personal convictions in shaping individuals' inclinations towards exercise. Moreover, the robustness of the proposed model is evidenced by the substantial R^2 value of 0.8, indicating its capacity to elucidate a significant proportion of variance in exercise intentions.

Conversely, from a practical standpoint, interventions geared towards promoting exercise should prioritize addressing subjective norms and behavioural attitudes, given their pronounced impact on individuals' exercise intentions. Strategies focusing on bolstering social support

networks and highlighting the positive outcomes associated with exercise may prove effective in influencing individuals' intentions to engage in physical activity. Although the sense of behavioural control may not emerge as the predominant predictor of exercise intentions in this study, its significance remains notable. Consequently, interventions aimed at enhancing individuals' perceptions of control over their exercise behaviours can facilitate the cultivation of stronger exercise intentions. Furthermore, the study underscores the importance of exercise intentions and the sense of behavioural control as significant predictors of exercise behaviour, underscoring their relevance in translating intentions into actual engagement. Interventions targeting these variables hold promise for fostering increased exercise participation. Despite the significant findings and implications, the study is not devoid of limitations, which may warrant

exploration in future research endeavours. Primarily, the relatively small sample size of 170 normal university undergraduates may limit the generalizability of the findings, as they may not fully represent the diverse population of college students. Additionally, the study exclusively focused on exercise intention and behaviour as dependent variables, overlooking potential influencers such as self-efficacy, motivation, and environmental factors. Future investigations could address these limitations by employing larger and more diverse samples, considering a broader array of variables, and employing longitudinal designs to investigate the enduring effects of exercise psychology on behaviour control among college students. Furthermore, given the study's focus on university undergraduates, future research could explore variations in findings by examining other student cohorts at different educational levels.

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