

Original Paper

A Study on the Influence of Physical Exercise on College Students' Psychological Resilience

Hongguo Guan^{1*}

¹ Hainan University of Science and Technology, Haikou, Hainan, China

* Corresponding Author (13648658808@163.com)

Fund Projects

Key University-level Project of Hainan University of Science and Technology (No. HKKY2024-ZD-26); Project of the Center for School Planning and Construction Development of the Ministry of Education (No. CSDP25LF4A403); Hainan Provincial Philosophy and Social Sciences Planning Project (No. HNSK(YB)24-71)

Received: May 18, 2026

Accepted: August 06, 2026

Online Published: August 21, 2026

doi:10.22158/wjeh.v8n3p169

URL: <http://dx.doi.org/10.22158/wjeh.v8n3p169>

Abstract

Against the background of the new era, social competition keeps intensifying, and college students are under multiple pressures from academic assessments, interpersonal communication, emotional distress and career-hunting. The incidence of psychological distress among college students has been on the rise. As an important concept in positive psychology, psychological resilience refers to the psychological capital that enables individuals to conduct self-regulation, achieve psychological recovery and pursue growth when confronted with setbacks and adversities. It is of great significance for preventing college students' psychological risks and maintaining their mental health. Physical exercise is not only physiologically valuable for building physical fitness, but also bears the educational functions of tempering willpower, relieving emotions and expanding social connections. Adopting literature analysis and semi-structured interview methods, this paper sorts out relevant theories on physical exercise and psychological resilience. Based on interview data collected from college students, it explores the specific impacts and internal mechanism of physical exercise on college students' psychological resilience, analyzes practical dilemmas existing in cultivating college students' psychological resilience via physical exercise in universities, and puts forward systematic practical approaches. The research shows that autonomous and regular physical exercise can improve college students' psychological resilience from multiple dimensions including emotion regulation,

will-power shaping and social support. Group sports exert a more prominent promoting effect on the optimism dimension of psychological resilience. This research can provide theoretical reference and practical basis for universities to implement moral education through physical activity and promote collaborative education between physical education and mental-health education.

Keywords

college students, physical exercise, psychological resilience, mental health, moral education through physical activity

1. Introduction

The stage of higher education serves as a critical window for young people to shape their personalities, establish values and develop psychological quality. Growing up in a society with rapid information development, contemporary college students enjoy favorable material conditions, yet they are confronted with increasingly complicated growth-related pressures. Academically, they are burdened by difficult courses and various examinations and competitions. In daily life, they need to independently handle conflicts in dormitory and interpersonal relationships with classmates (Wang & Yin, 2026). Upon graduation, they have to face realistic challenges such as postgraduate entrance examinations and job hunting. When multiple pressures accumulate, some college students lack the ability to withstand setbacks. When encountering failures and adversities, they tend to suffer from negative mental states such as anxiety, depression and self-doubt (Shi et al., 2025), which may even trigger psychological crises in severe cases. Under such circumstances, how to improve college students' ability to cope with adversities and cultivate sound psychological resilience has become a vital subject jointly concerned by ideological-political education, physical education and mental-health work in universities.

Also known as psychological elasticity, psychological resilience differs from traditional mental-health research which mainly focuses on correcting psychological problems. It lays emphasis on tapping individuals' internal positive psychological resources. Rather than an innate personality trait possessed by a small number of people, psychological resilience is a psychological quality that can be continuously cultivated and improved through acquired environments and behavioral practices. Cultivating psychological resilience does not mean that individuals will never feel pain or pressure. Instead, it enables them to adjust rapidly after setbacks and recover and grow from adversities. Therefore, exploring feasible approaches to foster resilience bears practical significance for college students' healthy development.

School physical education is an indispensable component of the "five-education integration" system. Opinions on Comprehensively Strengthening and Improving School Physical Education in the New Era stresses that school physical education should adhere to student-oriented principles, strengthen its role in tempering willpower and improving personality, and realize moral education through physical activity. As a physical practice, physical exercise involves constant experiences of exhaustion, failure,

persistence and breakthrough. Such real-life experiences cannot be fully replaced by classroom psychological counseling. Participation in physical activities can release accumulated negative emotions, temper willpower and build social platforms, which provides practical soil for the development of psychological resilience (Li et al., 2026).

Literature retrieved from CNKI shows that abundant domestic studies have been conducted on college students' psychological resilience. Existing quantitative studies have confirmed that physical exercise can predict individual psychological resilience, while psychological resilience also plays mediating or moderating roles in many mental-health models (Duan, 2025). Most existing researches adopt questionnaire-based quantitative methods to verify correlations between physical exercise and psychological resilience. Nevertheless, pure quantitative data can hardly capture college students' subjective inner experiences in sports, and in-depth analysis of how physical exercise reshapes individuals' psychological states remains insufficient. By contrast, qualitative research using interviews can listen to college students' real feelings, dig into psychological changes behind behaviors and better interpret the internal logic between the two variables.

Based on the above research background, this paper takes college students from general universities as research subjects. It sorts out theoretical foundations via literature analysis and obtains first-hand qualitative data through semi-structured interviews. This paper explores how physical exercise influences college students' psychological resilience, clarifies its internal acting paths, analyzes practical problems and puts forward targeted suggestions adapted to university reality, so as to offer references for mental-health education and physical-education curriculum reform in universities.

2. Definition of Core Concepts and Research Design

2.1 Definition of Core Concepts

2.1.1 Physical Exercise

Physical exercise refers to repetitive physical practices carried out voluntarily by individuals in spare time for the purposes of improving physical fitness, regulating moods and boosting physical and mental conditions. It contains four core elements: exercise frequency, single-session duration, exercise intensity and types of sports. According to participation modes, it can be divided into individual sports and group collaborative sports. Individual sports mainly include jogging, cycling, yoga and fitness training completed by participants themselves. Group collaborative sports include basketball, volleyball, badminton, frisbee and other events requiring communication, cooperation and confrontation among members. Physical exercise in this paper includes in-class physical practices in university public physical-education courses, with more emphasis on out-of-class sports activities initiated by college students themselves. Physical-education courses are compulsory academic tasks, while voluntary out-of-class physical exercise better reflects individuals' internal motivation and exerts more prominent effects on shaping psychological qualities.

2.1.2 Psychological Resilience

Psychological Resilience is also translated as psychological elasticity in domestic academia. Connor-Davidson developed the CD-RISC Resilience Scale. Yu Xiaonan and Zhang Jianxin revised its Chinese version adapted to local Chinese culture, and divided psychological resilience into three dimensions: tenacity, strength and optimism. Tenacity means individuals can think calmly, persist and refuse to give up when facing difficulties. Strength refers to the capacity for rapid psychological recovery and self-growth by drawing lessons from failures after setbacks. Optimism represents individuals' positive perceptions of adversities, their belief in personal competence to overcome difficulties and their willingness to hold expectations for the future. Interconnected with one another, the three dimensions constitute the complete level of psychological resilience. Psychological resilience is malleable. It can be shaped by external environments and individual behavioral practices, which provides a theoretical premise for improving psychological resilience through physical exercise in this research(Chu et al., 2026).

2.2 Research Methods

2.2.1 Literature Analysis

CNKI and Wanfang Database are adopted as major retrieval platforms. Search keywords include college students, physical exercise, psychological resilience, psychological elasticity, moral education through physical activity and sports-related mental health. Journal articles, master's and doctoral dissertations and national policy documents concerning school physical education are collected. Collected literatures are classified and read to sort out theoretical connotations, measurement dimensions and influencing factors of psychological resilience. This paper summarizes domestic and foreign research status concerning physical exercise and psychological resilience, concludes existing research achievements and identifies research gaps. Literature review constructs the overall research framework of this paper. Views from existing studies provide theoretical support for mechanism analysis, problem analysis and countermeasure proposal.

2.2.2 Interview Method

This study adopts the semi-structured interview method. Semi-structured interviews follow pre-designed outlines while allowing respondents to freely express their real thoughts, which is suitable for exploring subjective psychological experiences.

Interviewees: Fourteen college students from a local comprehensive university are selected as interviewees, including seven males and seven females covering freshmen, sophomores, juniors and seniors. Samples are divided into three groups: five students who frequently take physical exercise (no less than three times per week); five students who exercise occasionally (once or twice per week); four students who hardly participate in out-of-class physical exercise. Samples with different exercise habits are included to guarantee the richness of interview data.

Interview outline: Interview questions are designed around the research theme, mainly covering the following contents: first, basic information about respondents' daily physical exercise including sports

types, frequency and duration; second, mood and psychological changes before and after sports participation; third, inner feelings when feeling exhausted or suffering defeats in sports and how respondents cope with setbacks in sports; fourth, whether experience gained in sports can be transferred to scenarios with difficulties in study and daily life; fifth, differences in feelings brought by individual sports versus group sports; sixth, deficiencies existing in university physical-education courses and out-of-class sports activities; seventh, how physical exercise may improve college students' capacity to withstand setbacks.

Interview implementation: Interviews are conducted online and offline. Each interview lasts 20-35 minutes. Before interviews, research purposes are explained to respondents, and anonymity is guaranteed. Recordings are made with respondents' consent. After interviews, recordings are fully transcribed into textual materials. Texts are coded and key viewpoints are extracted to serve as first-hand qualitative materials for analysis in this paper.

3. The Influence and Internal Mechanism of Physical Exercise on College Students' Psychological Resilience

Based on literature theories and transcribed interview data, the influence of physical exercise on college students' psychological resilience is not a simple linear relationship. Distinct psychological effects arise from different sports-participation states and exercise forms. Regular and voluntary physical exercise can promote the three dimensions of psychological resilience (tenacity, strength and optimism) from the perspectives of physiological-emotional adjustment, individual will and cognition, as well as social support. By contrast, forced exercise and excessive competitive sports hardly improve psychological resilience.

3.1 Emotional Relief and Physiological Regulation: Laying a Physiological Foundation for Psychological Resilience

Many respondents who exercised regularly stated that when feeling depressed due to examination pressure or interpersonal conflicts, their mental distress would be released after jogging or ball games. Physiologically, long-term physical exercise can regulate the secretion of brain neurotransmitters such as dopamine and serotonin, reduce the level of cortisol—the human stress hormone, and improve individuals' emotion-regulation ability. In real-life scenarios, college students often have no direct outlet for negative emotions, and physical exercise provides a safe channel for catharsis. As anxiety and irritability are released, individuals achieve greater emotional stability and are less prone to impulsive breakdowns under adversities, which constitutes an important physiological prerequisite for the development of psychological resilience.

Some respondents mentioned that when forced to finish sports tasks with inner resistance, they only felt physically and mentally exhausted rather than relieved from psychological pressure. It follows that only voluntarily-engaged physical exercise can realize its emotion-regulating value. With stable emotions, college students will not be trapped in prolonged negative emotions when confronted with academic

failures or interpersonal conflicts. Equipped with the capacity for rapid emotional recovery, they gain support for the strength dimension of psychological resilience.

3.2 Frustration Experiences Reshaping Self-cognition: Enhancing Tenacity and Psychological Resilience

Sports are filled with frustration-related experiences: exhaustion brought by physical limits during long-distance running, repeated failures in mastering technical movements, and defeats in competitions are all real-world adverse scenarios. Many long-distance runners interviewed reported that they felt an overwhelming urge to quit halfway through races, yet forced themselves to keep going. After repeatedly overcoming physical pain, they became less likely to shrink back from academic difficulties. In physical exercise, college students continuously set small goals: completing a long run, mastering a new skill, or winning a competition. Each progress achieved by overcoming difficulties brings a sense of success, boosts self-efficacy, and fosters the inner belief that “I can overcome hardships”. This belief transfers to various frustrating situations in study and daily life and enhances the tenacity dimension of psychological resilience. Meanwhile, frequent failures in sports, such as losing matches or falling short of training expectations, train individuals to tolerate setbacks, accept wins and losses, understand that failure does not equal total defeat, and draw lessons from misfortunes, so as to strengthen the strength quality of psychological recovery.

A comparison of interview materials shows that students who stick to voluntary exercise tend to reflect and adjust after failures, whereas those lacking regular exercise are more inclined to evade difficulties and engage in self-denial with slower psychological recovery. Repeated physical persistence is gradually internalized into psychological willpower through embodied cognition, which represents a unique advantage of physical exercise over conventional classroom-based psychological education.

3.3 Group Sports Building Social Networks: Fostering the Optimism Dimension of Psychological Resilience

Interview data indicate that college students who regularly participate in group sports such as basketball, badminton and frisbee make acquaintances and gain companionship, encouragement and support in sports. Group sports demand communication and cooperation. In the process of collaboration and competition, participants expand their social circles and obtain practical social-support resources. Social support serves as a vital external protective factor for psychological resilience. When college students have peers to talk to, they can obtain emotional comfort amid adversities, their psychological recovery capacity is significantly enhanced, and optimistic mindsets are more likely to be formed.

Although individual sports such as jogging and cycling can release emotions and temper personal will, they lack peer interaction and barely generate social benefits. Introverted respondents mentioned that group sports constitute relaxed social occasions where interpersonal bonds can be strengthened through shared physical activity without deliberate small-talk, helping them open up and view things more positively. Nevertheless, interviews also reveal practical problems: most campus group competitions

are designed for student-athletes, leaving limited opportunities for ordinary students, many of whom have to resort to individual sports and cannot benefit from group sports in cultivating optimism.

3.4 Boundary Conditions for Physical Exercise to Generate Benefits for Psychological Resilience

Both interviews and literature demonstrate that the facilitating effect of physical exercise on psychological resilience is not absolute. If students are forced to take part in sports, blindly pursue competitive achievements, sustain heavy competitive pressure and suffer repeated defeats, physical activities will instead aggravate their psychological burdens. Only when individuals possess intrinsic motivation, exercise at moderate intensity, and accept wins and losses in sports, can physical exercise realize its value in nurturing mental health. Ignoring such boundaries and naively assuming that any form of exercise improves psychological quality will lead to cognitive misunderstandings.

4. Practical Dilemmas of Cultivating College Students' Psychological Resilience via Physical Exercise in Universities

Combining literature review and first-hand interview data, general domestic universities still face multiple practical dilemmas in improving college students' psychological resilience through physical exercise, covering four dimensions: individual cognition among students, physical-education teaching, after-class sports supply, and collaborative education integrating physical and mental health education.

4.1 Insufficient Physical Exercise among College Students and Biased Perceptions of the Mental-educational Value of Sports

More than half of the interviewees hardly engaged in voluntary after-class physical exercise. Their spare time was mostly occupied by academic work and mobile-phone entertainment, and sedentary behaviour was prevalent. Many college students regard physical exercise merely as a way to improve physical fitness, pass physical-fitness tests and obtain PE course credits. They only recognize its physical functions while ignoring its educational value in tempering willpower and regulating mentality. Some students avoid sports subjectively out of fear of sweating or the embarrassment of competition failures. Others participate in sports for highly utilitarian purposes merely to complete course assignments with inner resistance and lack intrinsic exercise motivation. Passive sports participation cannot produce positive psychological experiences and thus hardly fosters psychological resilience.

4.2 Over-emphasis on Skill Assessment in Public PE Courses and Absence of Resilience-cultivation Objectives

Public physical-education courses for all college students ought to be the main position for realizing mental cultivation through physical activity. However, multiple student respondents reported that PE teaching focuses heavily on technical instruction, physical-fitness training and meeting physical-test standards. Teaching designs prioritize students' technical proficiency and physical conditions, while lacking sessions for will-tempering, frustration education and teamwork. Teachers mostly demonstrate techniques in class and seldom guide students to reflect on persistence, failure and personal growth during sports. The assessment system centres on sports performance and physical-fitness scores,

adopting result-oriented evaluation and neglecting students' psychological growth in the exercise process. Psychological-resilience cultivation has not been truly incorporated into PE teaching objectives, and the mental-nurturing value of PE courses is weakened.

4.3 Imbalanced Supply of After-class Sports Activities and High Participation Thresholds for Ordinary Students in Group Sports

Campus after-class sports serve as an extension of in-class physical education. Nevertheless, current university sports resources tend to favour student-athletes. University sports meetings and various ball competitions are mainly participated by athletes from university or college teams, with limited access for ordinary students. Low-threshold recreational group sports open to the whole student body are insufficient. Many ordinary college students who want to join group sports lack teammates and activity platforms and have to choose individual sports such as jogging. Though individual sports can release emotions, they scarcely facilitate social expansion, so the resilience-cultivating function of group sports for the optimism dimension cannot be exerted. In addition, some universities face shortages of sports venues, which are in short supply after class and objectively restrict students' participation in group physical exercise.

4.4 Segregation between Physical-education Teaching and Mental-health Education and Inadequate Implementation of Integrated Physical-mental Collaborative Education

At present, university PE teachers are mainly responsible for teaching sports skills. Most of them have not received systematic sports-psychology training and lack capabilities to identify students' psychological states and provide mental guidance. University mental-health work is mainly undertaken by psychological counselling centres, where counsellors mostly rely on talking therapy and rarely introduce physical exercise as an auxiliary intervention. The physical-education system and mental-health-education system remain separated with insufficient communication and interaction. PE teachers are unfamiliar with psychological-intervention methods, while mental-health professionals lack knowledge of sports-based educational approaches. The integrated physical-mental education model exists only on paper instead of being implemented in daily teaching, and the educational strengths of the two systems cannot form synergies.

5. Practical Paths and Research Conclusions for Improving College Students' Psychological Resilience through Physical Exercise

5.1 Practical Paths

5.1.1 Strengthening Publicity and Guidance, Transforming College Students' Perceptions of Sports and Fostering Voluntary Exercise Motivation

Universities should popularize the mental-health benefits of physical exercise through thematic lectures, campus official WeChat accounts, class-level publicity and other channels, correcting students' one-sided view that "sports are only for physical fitness". Students should be made aware that overcoming exhaustion and accepting wins and losses in sports constitute training for psychological

resilience. Students are encouraged to select sports matching their personal interests instead of blindly pursuing high-intensity competition. Moderate voluntary physical exercise of around 30-60 minutes per session, three times per week is advocated. Respecting individual sports preferences and stimulating intrinsic participation motivation reduces perfunctory, task-driven exercise and lays foundations for psychological-resilience cultivation.

5.1.2 Optimizing Public PE Curriculum Design and Incorporating Psychological Resilience into Classroom Teaching Objectives

Universities should reform teaching objectives for public PE courses. Apart from teaching sports skills and improving physical fitness, explicit mental-educational goals concerning willpower, frustration tolerance and positive mindsets should be formulated. Appropriately challenging tasks and group competition and cooperation drills should be arranged in class to guide students to treat competition outcomes rationally and learn to try again after failures. Assessment systems should be reformed to abandon performance-only evaluation and improve process-oriented assessment, incorporating classroom persistence, teamwork performance and self-challenge into evaluation criteria. In endurance courses, students should be encouraged to compete against their past selves rather than against peers in speed. Ball-game courses should emphasize group-cooperation experience, turning PE classes into venues for both physical fitness and mental cultivation.

5.1.3 Enriching After-class Sports Supply and Lowering Participation Thresholds for Group Sports

Universities should reverse the bias of after-class sports towards student-athletes and vigorously develop low-threshold sports activities for all ordinary students, such as class-level sports leagues, fun sports meetings and club fitness events. Moderate-threshold group sports including frisbee, badminton and volleyball should be promoted to build platforms for ordinary students to take part in group sports and gain peer support through collaboration and competition. Campus sports-venue construction and opening-hour management should be optimized to guarantee after-class sports spaces. Universities should encourage students to find exercise partners and foster a campus sports atmosphere, so as to give full play to group sports in cultivating the optimism dimension of psychological resilience.

5.1.4 Promoting In-depth Integration of Physical and Mental-health Education and Building a Collaborative-education Mechanism

Systematic sports-psychology training should be provided for university PE teachers to raise their awareness of mental education and equip them to observe students' psychological states and deliver appropriate mental guidance in class. Psychological-counselling centres should explore sports-assisted psychological-intervention schemes, applying moderate physical exercise as an auxiliary counselling tool for students suffering heavy stress and low psychological resilience. Communication channels should be established between PE teachers and mental-health counsellors, enabling combined support of sports intervention and psychological counselling for students with psychological troubles. Elective courses on stress relief via sports and sports psychology can be offered to break down barriers between physical education and mental-health education and truly realize mental cultivation through physical

activity.

5.1.5 Implementing Stratified and Classified Guidance and Grasping Boundary Conditions for Mental Nurturing via Sports

Students with different personalities and psychological conditions are suited to different sports types. Introverted students lacking social support are prioritized for group sports to expand peer relationships. Students under long-term stress are recommended aerobic exercises such as jogging and cycling for emotional catharsis. Students with prominent fear-of-difficulty mindsets should be assigned progressive small exercise goals. One-size-fits-all policies and forced high-intensity competitive training should be rejected. Individual differences should be respected, positive sports experiences protected, and extra psychological pressure brought by physical activities avoided.

5.2 Research Conclusions

First, voluntary and regular physical exercise exerts a significant promoting effect on college students' psychological resilience. It mainly acts on the three dimensions (tenacity, strength and optimism) through three paths: physiological-emotional regulation, self-cognition reshaped by frustration experiences, and social support obtained from group sports. Compared with individual sports, group collaborative sports produce more prominent effects in fostering optimism. Forced exercise cannot improve psychological resilience, and definite boundary conditions exist for mental nurturing through sports.

Second, multiple practical dilemmas hinder universities' efforts to cultivate college students' psychological resilience through physical exercise: insufficient after-class sports participation and superficial understanding of sports' mental-educational value among college students; over-emphasis on skill assessment and absence of resilience-cultivation objectives in public PE courses; imbalanced after-class sports supply and high group-sports participation thresholds for ordinary students; segregation between physical-education teaching and mental-health education and inadequate implementation of integrated physical-mental education.

Third, to give play to the role of physical exercise in cultivating psychological resilience, universities should transform students' sports perceptions, optimize public PE curricula, enrich low-threshold after-class group sports activities, promote in-depth integration of physical and mental-health education, and implement stratified sports guidance to achieve dual development of physical fitness and mental cultivation.

5.3 Research Limitations

This qualitative study adopts semi-structured interviews, with respondents only selected from one local undergraduate university. Limited sample coverage imposes restrictions on the generalization of research conclusions. Although interview methods capture subjective experiences, large-sample quantitative analysis cannot be achieved. Follow-up research may expand interview samples and combine questionnaire-based quantitative studies to further deepen research on the relationship between physical exercise and psychological resilience.

References

- Chu, K. Q., Yang, X. Q., & Mo, Z. H. (2026). Relationships among physical exercise, psychological resilience and job burnout of special-education teachers: A cross-lagged analysis. *Chinese Journal of Special Education*, (3), 89-96.
- Duan, S. S. (2025). The influence of physical exercise on postgraduates' academic stress: Mediating effect of psychological resilience and moderating effect of self-efficacy. In *China Sport Science Society (Ed.), Proceedings of the 14th National Sport Science Congress-Poster Session (Sport Psychology Division)* (pp. 66-68). <https://doi.org/10.26914/c.cnkihy.2025.105853>
- Li, D., Mo, Z. Z., Gan, C. L. et al. (2026). The mediating effect of psychological resilience and the moderating effect of physical exercise. *Sports Time & Space*, (9), 83-86.
- Shi, Q., Hu, C., & Jin, C. J. (2025). Positive effects of physical exercise on alleviating depression among college students: The chain mediating role of social support and psychological resilience. *Journal of Social Science of Jiamusi University*, 43(12), 177-179.
- Wang, H., & Yin, Z. G. (2026). The influence of social support on college students' physical activity: A chain mediating effect based on psychological resilience and self-efficacy. *Sichuan Sports Science*, 45(3), 47-53. <https://doi.org/10.13932/j.cnki.sctyx.2026.03.08>