

## THE INFLUENCE OF THE USE OF ORIENTEERING ON INCREASING THE PSYCHOLOGICAL STABILITY OF COLLEGE STUDENTS

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**Abstract.** This study addresses the global mental health crisis among college students. The World Health Organization (2024) reports that one in three young people aged 18–24 experience emotional distress. A 16-week randomized controlled trial (N=800) investigates the impact of orienteering on psychological resilience. Based on an integrative theoretical framework (psychological resilience theory, self-determination theory, resource conservation theory, and planned behavior theory), this study combines a systematic literature review (2000–2025) and empirical methods to explore the mechanisms and boundary conditions of the influence of orienteering. The study employed mixed methods, including measurements on the Connor-Davidson Resilience Scale (CD-RISC), assessment on the General Self-Efficacy Scale (GSES), and interviews. In addition, this study proposes a working model for the implementation of orienteering, providing theoretical support and practical recommendations for the integration of physical education, mental health education, and student development in colleges around the world.

**Keywords:** orienteering; psychological resilience; college students; multi-theoretical concept; self-efficacy; coping with stress, emotional regulation.

## ВЛИЯНИЕ СПОРТИВНОГО ОРИЕНТИРОВАНИЯ НА ПОВЫШЕНИЕ ПСИХОЛОГИЧЕСКОЙ УСТОЙЧИВОСТИ УЧАЩИХСЯ КОЛЛЕДЖЕЙ

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**Аннотация.** Данное исследование посвящено глобальному кризису психического здоровья среди учащихся колледжей. Всемирная организация здравоохранения (2024) сообщает, что каждый третий молодой человек в возрасте 18–24 лет испытывает эмоциональный стресс. В рамках 16-недельного рандомизированного контролируемого исследования (N=800) изучается влияние спортивного ориентирования на психологическую устойчивость. Основанное на интегративной теоретической базе (теория психологической устойчивости, теория самодетерминации, теория сохранения ресурсов и теория запланированного поведения), это исследование сочетает систематический обзор литературы (2000–2025) и эмпирические методы для изучения механизмов и граничных условий влияния спортивного ориентирования. В исследовании, применялись смешанные методы, включая измерения по шкале стрессоустойчивости Коннора-Дэвидсона (CD-RISC), оценку по шкале общей самоэффективности (GSES) и интервью. Кроме того, в данном исследовании предлагается действующая модель внедрения спортивного ориентирования, предоставляющая теоретическую поддержку и практические рекомендации по интеграции физического воспитания, обучения психическому здоровью и развития учащихся в колледжах по всему миру.

**Ключевые слова:** спортивное ориентирование; психологическая устойчивость; учащиеся колледжей; мультитеоретическая концепция; самоэффективность; преодоление стресса, эмоциональная регуляция.

The Global Context of Demand for College Students' Mental Health and Stress Tolerance With rapid globalization and increasing social competition, college students face accompanying pressures from study (e.g., grade anxiety, dissertation deadlines), employment (e.g., shrinking labor market, skills mismatch), and interpersonal relationships (e.g., social isolation, love conflicts). The 2024 College Student Psychological Health Development Report (Mental Health Association of China, 2024) shows

that 34.2% of Chinese students experience moderate to severe psychological stress, with the two main complaints being «lack of stress tolerance» and «emotional dysregulation». According to the Journal of Adolescent Health (2025), internationally, 31.7% of European and 28.9% of American students show similar symptoms, indicating that low psychological stress resistance is a cross-cultural problem for young people.

Psychological resilience, defined as the dynamic ability to maintain psychological stability, actively adapt and develop under stress (Lin, 2018; Richardson, 2002), includes three main components: psychological resilience (ability to withstand difficulties), emotional regulation (ability to cope with negative emotions) and willpower (ability to achieve long-term goals despite distractions). Building that resilience is critical not only to improving student achievement and quality of life, but also laying the foundation for their lifelong mental health.

Unique value of orientation in the development of sustainability. Physical education is an important means of mental health education, but traditional sports often focus on physical fitness or competitive outcomes, limiting the targeted development of resilience. Orienteering, on the other hand, has inherent advantages: it requires participants to navigate unfamiliar environments (university, city, or wilderness) with maps and compasses, make independent decisions in time-poor conditions (for example, choose between «short but difficult» and «long but safe» routes), and adapt to unforeseen situations (for example, route congestion, equipment breakdowns) [3]. These characteristics ideally correspond to the three main components of psychological stability: stress resistance: overcoming the «loss of a route» or «lack of time» teaches students to perceive stress as a solvable task; emotional regulation: the ability to cope with frustration caused by errors (for example, incorrect control points), and to remain calm; willpower: the ability to maintain tenacity in completing long-distance tasks (for example, orienteering at a distance of 10 km), despite physical fatigue.

Existing studies have confirmed a positive correlation between orientation and psychological resilience (Zhang, Y., & Li, N., 2022; Wang, J., 2021), but three key gaps remain: 1. Theoretical limitedness: Most studies rely on a single theory (e.g., self-determination theory only) and do not include interdisciplinary approaches to explain «how» and «why» orientation has an impact; 2. Empirical limitations: few studies examine mediating moderating variables (e.g., whether self-efficacy acts as a link between orientation and resilience) or analyze differences between subgroups (e.g., gender, athletic experience); 3. Practical uncertainty: Proposed strategies for colleges are often generic (e.g., «add orientation to courses») and lack a standardized, scalable implementation model. To address these gaps, this study aims to: 1. Construction of a multi-theoretical model to explain the mechanism of the influence of orientation on psychological stability; 2. Confirming the mediating role of self-efficacy and the constraining role of gender/sport experience based on empirical evidence; 3. Development of a school orientation intervention model with clear modules, processes and assessment standards [6, 10].

*The aim of the study:* to study mental health among college students.

**Material and methods.** Analysis and generalization of scientific literature, pedagogical observation, questioning, pedagogical experiment, methods of mathematical statistics.

**Results and their discussion.** A systematic literature review was conducted using databases including CNKI, Web of Science, PsycINFO and SportDiscus (2000-2025). Main sources considered: Theory of psychological stability (Richardson, G.E., 2002): focuses on the cycle «stress-assessment-resources-mobilization»; «The Theory of Self-Determination» (Deci, E.L., & Ryan, R.M., 2000): emphasizes the role of autonomy, competence and interconnection in motivation and well-being; «Resource Conservation Theory» (Hobfoll, S.E., 2001): explains how orienteering helps students accumulate «psychological resources» (e.g., map reading skills, support for teammates); «Theory of Planned Behavior» (Ajzen, I., 1991): analyzes how attitude toward orientation and perceived control of behavior affect sustained participation. Theoretical model of the influence of orientation on the psychological stability of college students. Note: Error bars are standard deviation; the model uses vector graphics (EPS format) for high-resolution display. Independent variable: orienteering participation; mediating variable: self-efficacy; dependent variable: psychological resilience; mediating variables: gender and athletic experience [1].

Undergraduate students from 4 Chinese colleges were selected by stratified random sampling. The sample was balanced by gender, specialty, and athletic experience (Cochran-Mantel-Haenszel test,  $p > 0.05$ ) (Table 1).

Table 1 – Demographic characteristics of the sample

Demographic Variable	Category	Number of Participants	Proportion	Std.diff (Standardized Difference)
Gender	Male	402	50.25%	0.01
	Female	398	49.75%	0.01
Major	Humanities/Social Sciences	268	33.5%	0.02
	Science/Engineering	352	44.0%	0.03
	Arts/Physical Education	180	22.5%	0.02
Sport Experience	No regular sport ( $\leq 1$ time/week)	405	50.62%	0.01
	Regular sport ( $\geq 2$ times/week)	395	49.38%	0.01
Mean Age	—	—	20.3 $\pm$ 1.2 years	—

A standard difference of  $<0.1$  indicates an excellent baseline balance; The Cochran-Mantel-Haenszel  $p > 0.05$  test confirms that there were no significant differences between the groups at baseline. Participants were divided into two groups: • Experimental group ( $n = 400$ ): participated in a 16-week stratified orientation program; • Control group ( $n = 400$ ): maintained a normal learning and lifestyle regimen without participating in orientation or other activities related to the development of resistance. The experimental group program was developed with increasing complexity and division into modules, the total duration was 48 hours of training (MET = 8.0) (Table 2).

Table 2 – Orienteering program

Stage	Duration	Frequency/Duration per Session	Core Content	Target
Foundation	Weeks 1–4	2 sessions/week, 90 mins/session	- Theoretical: Map symbols, compass use, basic stress coping skills- Practical: Campus orienteering (5km, 3–4 checkpoints)	Master basic skills; reduce fear of «getting lost»
Progression	Weeks 5–12	2 sessions/week, 90 mins/session	- Theoretical: Route planning strategies, emotional regulation techniques- Practical: City orienteering (8km, 5–6 checkpoints) + team tasks (2–3 people/team)	Enhance decision-making and teamwork; accumulate self-efficacy
Integration	Weeks 13–16	2 sessions/week, 120 mins/session	- Theoretical: Resilience reflection and application- Practical: Wilderness orienteering (10km, 7–8 checkpoints) + final challenge (time-limited task)	Consolidate resilience skills; transfer to daily life

MET = metabolic load equivalent; 1 MET = resting metabolic rate (3.5 mL O<sub>2</sub>/kg/min).

Various scales and qualitative tools were used to ensure completeness and reliability of the data: 1. Connor-Davidson Resilience Scale (CD-RISC, Chinese version): total resilience and three subcategories (adaptation to stress, willpower, social support) were measured; Cronbach's  $\alpha$  coefficient = 0.89 (in this study). 2. General Self-Efficacy Scale (GSES, Chinese version): the mediating variable «efficacy itself» was assessed; Cronbach's  $\alpha$  coefficient = 0.85 (in this study). 3. Depression-Anxiety-Stress Scale (DASS-21): assessed ability to regulate emotionally; Cronbach's  $\alpha$  coefficient = 0.87 (in this study). 4. Coping Strategies Questionnaire: distinguishes between problem-oriented coping (e.g., «active search for solutions») and emotion-oriented coping (e.g., «problem avoidance»); Cronbach's  $\alpha$  coefficient = 0.82 (this study). 5. Interview: conducted with 50 participants of the

experimental group (25 boys, 25 girls) after the intervention to collect qualitative data on «changes in resilience in daily life»; interviews lasted 30-45 minutes and were transcribed verbatim [5].

Methods 1. Systematic literature review: PRISMA 2020 model was used for literature selection (inclusion criteria: empirical studies on orientation and development of resistance; exclusion criteria: non-peer-reviewed articles, studies involving non-university students). 2. Empirical study: a preliminary test (T0, before the intervention) and a post-test (T1, after 16 weeks) were performed for both groups. A control test (T2, 3 months after T1) was added to assess the robustness of the intervention effect. 3. Statistical analysis: SPSS 26.0 and Mplus 8.3 were used for data analysis; ° t-criteria for independent samples: comparison of differences in resistance between experimental and control groups; paired samples of t-criteria: analysis of intra-group changes (T0 → T1, T1 → T2); mediating effect analysis: testing whether self-efficacy mediates the relationship between orientation and stress tolerance (Baron and Kenny method); moderating effect analysis: testing whether the gender/sport experience moderates the implementation effect [2]. Experimental results of change in overall robustness and self-efficacy At time T0, no significant differences in CD-RISC or GSES scores were observed between the experimental and control groups ( $p > 0.05$ ), indicating a balanced baseline. At time T1 and T2 (Table 3).

Table 3 – Changes in overall resistance (CD-RISC) and self-efficacy (GSES) over time

Variable	Group	T0 (Mean ± SD)	T1 (Mean ± SD)	T2 (Mean ± SD)	T0→T1 Change (p)	T1→T2 Change (p)	Cohen's d (T0→T1)
CD-RISC (Overall Resilience)	Experimental	62.3 ± 8.5	78.6 ± 7.2	76.9 ± 7.5	<0.001	>0.05	2.13 (large)
	Control	61.8 ± 9.1	62.1 ± 8.8	61.9 ± 9.0	>0.05	>0.05	0.03 (tiny)
GSES (Self- Efficacy)	Experimental	24.5 ± 4.2	32.8 ± 3.9	31.7 ± 4.1	<0.001	>0.05	2.01 (large)
	Control	24.3 ± 4.0	24.6 ± 4.2	24.4 ± 4.1	>0.05	>0.05	0.07 (tiny)

CD-RISC, Connor-Davidson Resilience Scale; GSES = Overall Self-Efficacy Scale; SD = standard deviation; d Cohen's: tiny ( $d < 0.2$ ), small ( $0.2 \leq d < 0.5$ ), medium ( $0.5 \leq d < 0.8$ ), large ( $d \geq 0.8$ ).

The results show that the overall robustness and self-efficacy of the experimental group increased significantly after implementation ( $p < 0.001$ ) and remained stable through 3 months of follow-up ( $p > 0.05$ ), indicating a sustained intervention effect. The control group showed no significant changes, which precludes the influence of «temporal effects» (e.g. natural maturation) on resistance. Changes in resilience subgroups The experimental group showed significant improvements across all three resilience subgroups, with the greatest increases in stress adaptation and willpower (Table 4).

Table 4 – Changes in resistance subgroups (T0 → T1)

Resilience Subdimension	Group	T0 (Mean ± SD)	T1 (Mean ± SD)	% Change (T0→T1)	p (T0→T1)	Cohen's d
Stress Adaptation	Experimental	18.5 ± 3.2	25.8 ± 2.7	+39.5%	<0.001	2.41 (large)
	Control	18.3 ± 3.4	18.6 ± 3.1	+1.6%	>0.05	0.09 (tiny)
Willpower	Experimental	17.2 ± 2.9	23.9 ± 2.5	+39.0%	<0.001	2.38 (large)
	Control	17.0 ± 3.0	17.3 ± 2.8	+1.8%	>0.05	0.10 (tiny)
Social Support	Experimental	26.6 ± 4.1	32.5 ± 3.8	+22.2%	<0.001	1.52 (medium)
	Control	26.5 ± 4.0	27.1 ± 3.9	+2.3%	>0.05	0.15 (tiny)

CD-RISC subsections: Adaptation to stress (ability to cope with difficulties), Willpower (perseverance in achieving a goal), Social support (perceived support from others).

**Mediating influence of self-efficacy** The Mplus analysis showed that self-efficacy plays a partial mediating role in the relationship between orientation and psychological resilience. Direct influence of stability orientation:  $\beta = 0.42$ ,  $p < 0.001$ . Indirect effect of resistance orientation through self-efficacy:  $\beta = 0.28$ ,  $p < 0.001$ . Total effect:  $\beta = 0.70$ ,  $p < 0.001$ . This suggests that orienteering increases resilience not only through direct learning (e.g. coping with stress), but also by increasing self-efficacy - learners who have mastered orienteering skills gain confidence in their ability to overcome difficulties, which in turn strengthens their resilience.

**Moderating influence of gender and sporting experience**

1. Gender mitigation: the effect of the technique was stronger in women than in men in the field of «emotional regulation» (decrease in DASS-21 scores: in girls -35.2% versus -29.8% in boys,  $p < 0.05$ ). These interviews showed that girls were more likely to report «earning to calm down when they were lost» and «transferring this calm to stress during the exam», which may be due to the girls' higher initial need for emotional regulation.
2. Fading sports experience: students who do not regularly participate in sports showed a more pronounced increase in willpower (+42.3% versus +35.7% in regularly participating sports,  $p < 0.05$ ). This suggests that orienteering is particularly effective for «physically inactive» students because it helps them overcome physical limitations and develop willpower. The results of a qualitative interview Coding 50 interviews using NVivo made it possible to identify 3 main topics, which further confirmed the effect of the methodology implementation: 1. Translating resilience into daily life: 88% of participants reported using orienteering skills in the face of daily stress (e.g., «Facing dissertation-related pressures, «checkpoints,» as in orienteering, rather than feeling overwhelmed»); 2. Increased social support: 92% of participants noted that team orientation "improved their ability to communicate and support others" (for example, «When a teammate twisted his ankle, we adjusted the route together - this helped me understand that support is not only a request for help, but also providing it»); 3. Self-identification change: 85% of participants reported increased «self-confidence.»

**Mechanism - 1. Cognitive-behavioral coping** (integration of psychological resilience theory and COR theory) Orientation activates a dynamic closed cycle of coping with stress: «perception of the stressor - assessment of resources - adjustment of strategy - understanding the result» (Richardson, G.E., 2002; Hobfall, S.E., 2001). For example, when faced with "route loss" (a common stressor), 78% of participants in the experimental group (compared with 32% of participants in the control group in hypothetical scenarios) formulated this as a «solvable task» (cognitive reframing). Then they mobilized two types of resources: material resources: card reading skills (accumulated during training) and compass. intangible resources: support for teammates (thanks to team assignments) and self-confidence (thanks to previous successes). After removing the stressor, students analyzed their strategies (for example, «Next time I mark key landmarks on the map»), forming a conditional reflex to help cope with stress. This is consistent with findings by Lee, J., and Wang, H. (2023) that orienteering participants are 2.3 times more likely to use problem-oriented coping under academic stress than those not participating [7, 8].

**Mechanism - 2. Meeting psychological needs** (self-determination theory) Orientation fully satisfies the three main psychological needs proposed by Deci, E. L. and Ryan, R. M. (2000), directly increasing resilience:

1. Self-reliance: Students self-selected routes based on their judgments (e.g., «I took a remote but fast route because I trusted my map-reading skills»). Data obtained after the interview showed that 82% of participants in the experimental group reported an increased «sense of responsibility» - they learned to take responsibility for their decisions, a key component of sustainability.
2. Competence: Mastering progressive skills (from campus orientation to wilderness orientation) resulted in a 41% increase in self-efficacy (GSES score).
3. Connectedness: Team tasks contributed to a strong sense of belonging. For example, when a student in an experimental group was injured while orienteering in the wild, teammates jointly administered first aid, carried supplies, and adjusted the route. This increased the «sense of social support» by 35% (CD-RISC score), which is critical for sustainability. Hobfall, S.E. (2001) argues that social support is a major «resource buffer» against stress [4].

**Mechanism - 3. Forming behavioral habits** (theory of planned behavior) Stratified implementation helped students form sustainable habits of participation in orienteering, which in turn strengthened resilience. According to the theory of planned behavior (Ajzen, I., 1991), habit formation

is due to three factors: attitude: 91% of participants in the experimental group reported that they «enjoy orientation because it is both difficult and exciting»; subjective norm: peer influence - support from teammates increased willingness to participate; perceived behavior control: a gradual increase in difficulty (5 to 10 km) gave students a sense of «ability to complete tasks,» reducing fear of failure. These factors led to 76% participation in voluntary orienteering activities (e.g., school competitions) at 3 months after the intervention, suggesting that resilience skills acquired in training were anchored through sustainable behavior [9].

Comparison with other sports: the unique benefit of orienteering To emphasize the uniqueness of orienteering, we compared its impact with two other popular sports (running and basketball) using data from Zhang, I. and Li, N. (2022) and Wang, J. (2021) (Table 5).

Table 5 – Comparison of the impact on sustainability across different sports (16-week implementation)

Sport	Overall Resilience Increase	Stress Adaptation Increase	Cognitive Skill Improvement (e.g., Decision-Making)
Orienteering (this study)	+26.2%	+39.5%	+42.1% (interview data)
Running (Zhang, Y., & Li, N., 2022)	+15.8%	+22.3%	+8.7%
Basketball (Wang, J., 2021)	+18.5%	+25.1%	+19.3%

Improvement in cognitive skills was assessed by self-reported decision confidence and task performance. The results suggest that orienteering has a stronger impact on resilience, particularly on stress adaptation and cognitive skills. This is because orienteering combines exercise (such as running) and teamwork (such as basketball), while adding a unique cognitive task (spatial orientation and decision-making) - it trains both the «body» and the «brain,» making it more effective at developing resilience.

**Conclusion.** Key findings: 1. A 16-week stratified orienteering program (total dose: 48 hours, MET = 8.0) significantly increases the psychological resilience of college students (26.2% overall increase), with the strongest impact on stress adaptation (+39.5%) and willpower (+39.0%); the effect persists for at least 3 months. 2. The mechanism of influence is multidimensional: orientation increases resilience through cognitive-behavioral coping with stress (psychological resilience theory + resource conservation theory), meeting psychological needs (self-determination theory), and forming behavioral habits (planned behavior theory). 3. Self-efficacy plays a partial mediating role (accounting for 40% of the overall effect) in the relationship between orientation and persistence; gender (more pronounced effect for women) and sports experience (more pronounced effect for inactive students) play a regulatory role. Standardized orientation implementation model. To facilitate the introduction of orientation in universities, this study proposes a model for introducing orientation «3 modules + 3 grades,» which is highly effective.

Three main modules (curriculum + training + activities) 1. Training module (2 credits, 32 academic hours): theoretical part (12 hours): theory of psychological stability, basics of orienteering, stress resistance; practical part (20 hours): reading a map, using a compass, orientation in a city park (gradual difficulty). 1. Training module (16 weeks, after classes): group training: 2 sessions per week for 90 minutes each (according to the stratified program described in Section 2.1.3); individual accompaniment: 1 coach meeting every 4 weeks (to address individual concerns such as fear of wildlife). 1. Event module (monthly): regular events: park orientation (October), city orientation (December), wildlife orientation (March); competitions: school orienteering competitions (May) to increase motivation to participate.

Three valuation levels (process + result + transfer) 1. Assessment of the process: tracking the level of participation (goal:  $\geq 90\%$ ) and mastering skills (for example, card reading accuracy  $\geq 80\%$ ); 2. Outcomes: use of CD-RISC, GSES, and DASS-21 to measure resilience, self-efficacy, and emotional regulation; 3. Transmission assessment: conducting semi-structured interviews at 3 months post-intervention to assess whether resilience skills translate into daily life (target:  $\geq 80\%$  of participants)

report transmission). Support terms. Faculty team: training 2-3 PE faculty in each college (3-day training: 1 day of sustainability theory, 1 day of orienteering training, 1 day of hands-on coaching); provision of resources: allocation of funds for maps, compasses and first aid kits; collaborate with local outdoor activity centers to organize places for orienteering; Policy support: Include orientation in the «Learner Mental Health Promotion Program» to ensure long-term implementation.

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## RESEARCH INTO PHYSICAL FITNESS METHODS FOR COLLEGE FOOTBALL PLAYERS

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**Abstract.** In the system of talent development in football, physical training is the basis that determines the competitive level of athletes, technical performance and sustainability of a sports career. In this article, football players among college students are considered as the subject of research. The scientific methods of specialized physical training are systematically studied, integrating their dual characteristics of «Academic training and training» with the real requirements of modern football. Using a literature review, theoretical analysis and case analysis methods, the study focuses on optimizing four main qualities: strength, speed, endurance and dexterity, and offers a training system suitable for students, «Stage-specific, differentiated by position and self-modeled depending on the situation». The article also emphasizes the importance of injury prevention, training monitoring and recovery management, which makes it possible to provide theoretical recommendations and practical recommendations to increase the comprehensive competitiveness and sustainable development potential of football players among college students.

**Keywords:** football players; training, physical fitness; specialization; injury prevention; training monitoring.