International Journal of Education and Social Development
ISSN: 3078-9931 (Print), ISSN: 3078-2287 (Online) | Vol. 9, No. 1, 2026

Perspective Suicidal Ideation Among College Students and Exercise Intervention Strategies from the Perspective of Self-Determination Theory: A Theoretical Analysis

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Abstract: This research takes the Self - Determination Theory as the theoretical framework and deeply analyzes the influence mechanism of college students' suicidal ideation, and puts forward targeted exercise intervention strategies accordingly. The research uses the literature research method to sort out relevant theories and research results, collects data on college students' self - determination needs, suicidal ideation, etc. through a questionnaire survey method, and uses a structural equation model to analyze the relationships among various variables. The study found that the unmet needs for autonomy, competence, and relatedness have a direct or indirect impact on college students' suicidal ideation through different mediating variables. Based on this, exercise intervention strategies to meet the needs for autonomy are proposed, such as providing opportunities to choose exercise items independently and formulating personalized exercise plans; exercise intervention strategies to meet the needs for competence, including setting hierarchical exercise goals, providing skill training and feedback; and exercise intervention strategies to meet the needs for relatedness, such as organizing team exercise activities and establishing exercise social groups, aiming to provide theoretical and practical basis for the prevention and intervention of college students' suicidal ideation.

Keywords: Self - Determination Theory; College Students; Suicidal Ideation; Influencing Mechanism; Exercise Intervention Strategies.

1. Introduction

In recent years, mental health issues among college students have garnered increasing attention from all sectors of society. Research indicates a rising trend in poor mental health status among university students, with suicidal ideation—one of the most severe manifestations of mental health crises—requiring particular emphasis. A survey conducted among Beijing university students revealed that 13.77% reported suicidal thoughts, highlighting the severity of this issue[1]. Furthermore, significant correlations have been established between mental health and social support with suicidal ideation, while life attitudes positively influence suicidal tendencies through mental health outcomes, underscoring the critical role of mental well-being in suicide prevention. Meanwhile, psychological crisis intervention—a key approach to addressing student mental health challenges—its effectiveness hinges on a deep understanding of underlying crisis mechanisms. Against this backdrop, Self-Determination Theory has emerged as a pivotal theoretical framework for studying college student mental health, focusing on how fulfillment of fundamental psychological needs impacts mental health. The theory emphasizes the positive effects of satisfying autonomy, competence, and relationship needs on individual mental well-being, providing novel insights into the mechanisms underlying suicidal ideation in college students[2].

Self-Determination Theory (SDT) is a theoretical framework that focuses on individual motivation and the fulfillment of psychological needs, centered around three fundamental psychological needs: autonomy need, competence need, and relationship need. Autonomy need refers to an individual's sense of freedom and control over behavioral choices, emphasizing the stimulation of intrinsic motivation and reduction of external control. Competence need manifests as an individual's perception of exceptional performance in specific tasks and is closely linked to a sense of achievement. Relationship need pertains to the desire to establish emotional connections with others, highlighting the importance of social support[3]. The satisfaction of these psychological needs is widely recognized as a key factor in promoting mental health and well-being. SDT has been extensively applied in fields such as education, health behavior, and organizational management, particularly in exploring how environmental design can meet individual psychological needs to enhance behavioral outcomes. In educational settings, fulfilling students' autonomy needs significantly enhances their learning motivation and academic performance.

Domestic and international research on college students' suicidal ideation primarily focuses on two aspects: influencing factors and current prevalence. Studies indicate that the emergence of suicidal ideation is closely associated with mental health status, levels of social support, and life events. Research has shown that active participation in class activities and physical exercise serve as protective factors against suicidal ideation, whereas psychological stress and interpersonal difficulties significantly increase its risk[4]. Additionally, parent-child attachment, peer attachment, and a sense of life meaning have been demonstrated to exhibit significant negative correlations with suicidal ideation, highlighting the crucial role of positive social relationships and healthy life values in prevention. However, existing studies predominantly concentrate on independent analyses of individual factors, lacking systematic exploration of multifactorial interactions, and there remains insufficient investigation into differences across different demographic

groups—areas that warrant further attention in future research[5].

The relationship between the three core psychological needs of Self-Determination Theory and suicidal ideation among college students has garnered considerable attention. Research indicates that when students' autonomy needs are unmet, they are prone to negative emotions and psychological stress, thereby increasing the risk of suicidal ideation; frustration related to competence needs may lead to self-denial and depressive symptoms, further triggering suicidal thoughts; whereas deficiencies in relational needs can result in interpersonal isolation and emotional emptiness, directly precipitating suicidal ideation[6]. Nevertheless, significant gaps remain in current research: the specific mechanisms through which these three needs indirectly influence suicidal ideation via mediating variables remain unclear, and studies focusing on differences across specific groups (e.g., students of different genders, academic years, or disciplinary backgrounds) are scarce. This study aims to address these gaps by employing a multi-factor analysis approach to thoroughly examine the mechanisms underlying the impact of suicidal ideation on college students within the framework of Self-Determination Theory.

The positive impact of physical activity on college students 'mental health has been extensively validated by research. Sports not only improve individuals' physiological well-being but also alleviate psychological stress by regulating emotions, enhancing self-esteem and self-efficacy, thereby reducing the risk of suicidal ideation. As a non-pharmacological intervention, exercise therapy demonstrates significant value in preventing and treating psychological disorders. Team sports foster positive interpersonal interactions, helping meet students' social needs and mitigate feelings of loneliness and social isolation; personalized exercise plans cater to individual autonomy needs and strengthen intrinsic motivation for physical activity. Furthermore, tiered exercise goals and skill feedback mechanisms have proven effective in boosting personal competence and improving mental health outcomes. These findings provide crucial evidence for designing targeted exercise interventions based on self-determination theory.

2. The Mechanisms Influencing College Students' Suicidal Ideations from the Perspective of Self-Determination Theory

2.1. Personal Needs and Suicidal Thoughts Among College Students

2.1.1. The Connotation and Measurement of Autonomous Demand

Autonomy demand, as one of the core psychological needs in self-determination theory, emphasizes an individual's sense of freedom and self-directedness in behavioral choices. For college students, fulfilling autonomy demand manifests not only in how academic tasks are selected and completed but also in extracurricular activities, social interactions, and personal goal-setting. Research indicates that when students perceive high levels of autonomy in their studies and daily lives, their mental health significantly improves; conversely, deprivation of autonomy demand may lead to the accumulation of negative emotions and psychological stress[7]. To quantify the satisfaction with autonomy demand, researchers typically employ the Basic Psychological Needs Satisfaction Scale (BPNS) or its adapted versions. These scales assess individuals' sense of autonomy across multiple dimensions, such as "I can freely decide how to complete a task" or "I feel my actions are driven by intrinsic motivation." Such measurement tools have been widely validated for use among college students and demonstrate high reliability and validity.

Furthermore, the manifestation of autonomous needs in college students 'psychological development is closely linked to the clarity of their self-concept. Research indicates that individuals with a clear self-concept are better able to integrate their personal needs with the external environment, thereby demonstrating greater autonomy in their behavioral choices. Therefore, when examining the nature of autonomous needs, it is essential to consider the developmental stages of college students and their specific manifestations across various life domains. In sports exercise intervention studies, autonomous needs are reflected through students' autonomy in selecting sports activities and designing exercise plans; such empowerment enhances their participation motivation and psychological well-being[8].

2.1.2. The Direct Impact of Personal Needs on College Students' Suicidal Ideation

When college students' need for autonomy remains unmet over an extended period, their psychological state may gradually deteriorate, thereby increasing the risk of suicidal ideation. Relevant studies indicate that deprivation of autonomy leads individuals to experience feelings of helplessness and loss of control; if these negative emotions are not addressed promptly, they may evolve into deeper psychological issues such as depression and anxiety[9]. Particularly in higher education settings, some students struggle to achieve sufficient autonomy in both academic and daily life due to factors like academic pressure, family expectations, or social comparisons, a situation that readily triggers psychological crises. A longitudinal study among college students found that individuals with low satisfaction in their autonomy needs exhibited higher levels of suicidal ideation during subsequent follow-ups, and this association remained statistically significant after controlling for other confounding variables.

From a psychological perspective, the absence of autonomy needs weakens an individual's intrinsic motivation, leaving them lacking both the drive and coping resources to persevere when facing challenges. This depletion of psychological resources not only impairs daily functioning but may also lead to skepticism or denial of life's meaning[10]. Particularly in the absence of effective social support, deprivation of autonomy needs can serve as a significant trigger for suicidal ideation. Therefore, understanding the direct relationship between autonomy needs and suicidal ideation is crucial for developing targeted intervention strategies.

2.1.3. Autonomous needs influence suicidal ideation through mediating variables

The impact of autonomy needs on college students 'suicidal ideation extends beyond direct effects and may also manifest indirectly through a series of mediating variables. Among these, self-efficacy and coping styles serve as two key mediators. Self-efficacy refers to an individual's confidence in their ability to accomplish specific tasks; research indicates that fulfilling autonomy needs significantly enhances self-efficacy, whereas low self-efficacy shows a significant

positive correlation with suicidal ideation[11]. When college students have sufficient autonomy in academic or social domains, their perception of task completion ability improves, thereby reducing self-denial stemming from experiences of failure.

Furthermore, coping strategies play a significant mediating role between autonomy needs and suicidal ideation. Research indicates that individuals with higher satisfaction in their autonomy needs are more likely to adopt positive coping strategies—such as problem-solving and seeking support—while avoiding negative coping mechanisms like avoidance and self-blame. This positive coping pattern helps alleviate psychological stress and reduce the risk of suicidal ideation. Conversely, when autonomy needs are deprived, individuals may tend to employ negative coping strategies, thereby exacerbating psychological distress[12]. Therefore, enhancing college students' satisfaction with autonomy needs through interventions not only directly improves their mental health but also indirectly reduces suicidal ideation by strengthening self-efficacy and optimizing coping strategies.

2.2. Competency Requirements and College Students' Suicidal Ideations

2.2.1. The Connotation and Measurement of Competency Requirements

Competency needs refer to the psychological requirement for individuals to demonstrate competence and achieve success in specific domains, particularly evident in college students 'academic performance and social interactions. Academically, these needs manifest as knowledge acquisition, pursuit of academic excellence, and ability to solve complex problems; socially, they involve building positive interpersonal relationships, gaining recognition from others, and developing a sense of belonging[13]. Research indicates that fulfilling competency needs significantly enhances college students' self-esteem and confidence, whereas dissatisfaction with these needs may lead to self-doubt and accumulated psychological stress. To quantify the level of competency need satisfaction, researchers commonly employ the Competency Needs Subscale within the Basic Psychological Needs Satisfaction Scale (BPNS) or develop specialized measurement tools tailored to specific contexts. In physical exercise intervention studies, competency need satisfaction can be assessed by evaluating participants' perception of their performance during exercise tasks.

Furthermore, competence needs are closely linked to college students 'sense of life meaning. Research indicates that individuals who experience high levels of competence in academic or social domains also exhibit a stronger perception of life meaning; this positive psychological experience helps mitigate the emergence of suicidal ideation[14]. Therefore, when examining the nature of competence needs, it is essential to consider college students' developmental stages and living environments, analyzing their specific manifestations across different domains and their impact on mental health.

2.2.2. The Direct Impact of Competency Requirements on College Students' Suicidal Ideation

Frustration related to competence needs has a significant direct impact on the development of suicidal ideation among college students. In higher education settings, academic pressure and competitive environments lead many students to frequently experience failures in their pursuit of achievement; persistent setbacks in meeting these competence needs may result in a comprehensive denial of one's own abilities and even lead to doubts about the meaning of life[15]. A study involving college students revealed that those with poor academic performance or strained social relationships exhibited higher levels of suicidal ideation during follow-up assessments, and this association remained statistically significant after controlling for other demographic variables.

From a psychological perspective, the absence of competence needs undermines an individual's sense of self-worth, making them more susceptible to feelings of helplessness and despair when facing setbacks. Particularly in the absence of effective social support, the frustration associated with competence needs can serve as a significant trigger for suicidal ideation[16]. Therefore, understanding the direct relationship between competence needs and suicidal ideation is crucial for developing targeted intervention strategies.

2.2.3. Competency requirements influence suicidal ideation through mediating variables

The impact of competence needs on college students 'suicidal ideation extends beyond direct effects and may also manifest indirectly through mediating variables such as self-esteem and depressive emotions. Self-esteem, as an individual's overall evaluation of their own worth, serves as a crucial bridge between competence needs and mental health. Research indicates that fulfilling competence needs significantly enhances self-esteem levels, whereas low self-esteem is strongly positively correlated with suicidal ideation. When college students receive adequate recognition for their achievements in academic or social domains, their sense of self-worth improves, thereby reducing self-denial stemming from experiences of failure.

Furthermore, depressive mood plays a significant mediating role between competence needs and suicidal ideation. Research indicates that individuals with low satisfaction in their competence needs are more prone to exhibiting depressive symptoms, and heightened depressive mood further increases the risk of suicidal thoughts[17]. Therefore, implementing interventions to enhance college students' satisfaction with their competence needs not only directly improves their psychological well-being but also indirectly reduces suicidal ideation by boosting self-esteem and alleviating depressive symptoms.

2.3. Relationship Needs and College Students' Suicidal Intentions

2.3.1. The Connotation and Measurement of Relationship Requirements

The need for relationships emphasizes the psychological requirement for individuals to obtain a sense of belonging and social support in interpersonal interactions, which is particularly crucial in the formation of interpersonal relationships among college students[18]. During university years, students undergo transitions from their family environment to the campus setting, and the restructuring of their social networks places greater demands on fulfilling this need. Research indicates that meeting the need for relationships significantly enhances college students 'social adaptability and psychological well-being, whereas its deprivation may lead to feelings of loneliness and emotional isolation. To quantify the satisfaction of this need, researchers commonly employ the relationship needs subscale of the Basic Psychological Needs Satisfaction Scale (BPNS) or develop specialized measurement tools tailored to specific

contexts. In social interaction studies, the fulfillment of relational needs can be assessed by evaluating individuals' sense of participation and belonging within group activities.

Furthermore, relationship needs are closely linked to college students 'mental health. Research indicates that when individuals receive adequate support in interpersonal relationships, their perception of life meaning becomes more pronounced, and this positive psychological experience helps mitigate the development of suicidal ideation[19]. Therefore, when examining the nature of relationship needs, it is essential to consider college students' social characteristics and living environments, analyzing their specific manifestations across different domains and their impact on mental health.

2.3.2. The Direct Impact of Relationship Needs on College Students' Suicidal Ideation

The deprivation of relational needs has a significant direct impact on the development of suicidal ideation among college students. During their university years, some students struggle to establish stable interpersonal relationships due to introverted personalities, inadequate social skills, or difficulties adapting to the campus environment. Persistent unmet relational needs may lead them into states of loneliness and emotional isolation. A study involving college students revealed that those experiencing stronger social isolation exhibited higher levels of suicidal ideation in subsequent follow-ups, and this association remained statistically significant even after controlling for other demographic variables. From a psychological perspective, the absence of relational needs weakens an individual's social support system, leaving them without emotional support or coping resources when facing life pressures[20]. Particularly in the absence of intimate relationships, the deprivation of relational needs can serve as a major precipitating factor for suicidal ideation. Therefore, understanding the direct relationship between relational needs and suicidal ideation is crucial for developing targeted intervention strategies.

2.3.3. Relationship demands influence suicidal ideation through mediating variables

The impact of relationship needs on college students 'suicidal ideation extends beyond direct effects and may also manifest indirectly through mediating variables such as social support and loneliness. Social support, defined as the emotional, informational, and substantive assistance individuals receive from others, serves as a crucial bridge between relationship needs and mental health. Research indicates that fulfilling relationship needs significantly enhances individuals' perception of social support, whereas low social support is strongly positively correlated with suicidal ideation. When college students establish meaningful friendships or engage in positive group activities on campus, their social support systems are strengthened, thereby reducing suicide risk associated with loneliness.

Furthermore, loneliness plays a significant mediating role between relational needs and suicidal ideation. Research indicates that individuals with lower satisfaction in their relational needs are more prone to experiencing loneliness, and heightened loneliness further increases the risk of suicidal thoughts[21]. Therefore, implementing interventions to enhance college students' satisfaction with their relational needs not only directly improves their psychological well-being but also indirectly reduces suicidal ideation by strengthening social support and alleviating loneliness.

3. Exercise Intervention Strategies Based on Self-Determination Theory

3.1. Exercise Intervention Strategies to Meet Autonomous Needs

3.1.1. Providing opportunities for students to choose their preferred sports activities

Allowing students to choose sports activities based on personal interests and preferences significantly enhances their motivation and autonomy in physical engagement, thereby reducing the risk of suicidal ideation. According to self-determination theory, the need for autonomy—a fundamental psychological requirement—is directly linked to an individual's mental health when met within sports contexts[22]. Research shows that when college students are granted the freedom to select sports activities in public physical education courses, their autonomous motivation markedly increases, and exercise habits become more sustainable. This autonomous choice not only respects individual differences but also fosters sustained participation by stimulating intrinsic motivation. Furthermore, choosing sports activities independently helps alleviate feelings of external control, enabling students to experience greater enjoyment and a sense of achievement during exercise, which in turn mitigates negative emotions stemming from psychological stress and provides crucial support for preventing and addressing suicidal ideation.

3.1.2. Develop a personalized exercise plan

Developing personalized exercise plans is an effective approach to meet college students 'need for autonomous decision-making and plays a positive role in preventing and intervening with suicidal ideation. Self-determination theory emphasizes that individual autonomy in physical activities manifests not only in choice freedom but also in the ability to make decisions about one's own behaviors. By designing flexible, tailored exercise plans that account for individual differences among college students—such as physical fitness levels, exercise preferences, and time availability—exercise participation and adherence can be significantly enhanced[23]. Developing exercise programs that incorporate both short-term and long-term goals aligned with students 'interests and objectives helps them gradually build confidence and a sense of achievement during physical activity. This personalized intervention approach not only fulfills students' desire for autonomy but also provides clear behavioral guidance, thereby reducing psychological burdens caused by vague goals or excessive pressure and further lowering the risk of suicidal ideation.

3.2. Exercise Intervention Strategies That Meet Competency Requirements

3.2.1. Setting Hierarchical Movement Goals

Establishing tiered exercise goals that progress from easy to challenging constitutes an effective intervention strategy, enabling college students to gradually enhance their sense of competence during physical activity and thereby reduce suicidal ideation. According to self-determination theory, fulfilling competence needs serves as a crucial foundation for mental health[24]. In sports contexts, tiered goal setting enhances individual competence through gradual challenges and a sense of achievement. Research demonstrates that when students achieve phased objectives during exercise, their self-efficacy significantly improves alongside increased

motivation for subsequent activities. This approach not only helps students overcome initial setbacks but also strengthens intrinsic motivation through accumulated success experiences. Furthermore, goal design should align with students' actual capabilities, ensuring each objective is both challenging yet achievable—thereby boosting competence while preventing psychological frustration from overly ambitious targets, providing robust support for suicide prevention and intervention.

3.2.2. Provide skills training and feedback

Through sports skills training and timely feedback, college students 'perception of athletic competence and fulfillment of competency needs can be significantly enhanced, thereby playing a positive role in preventing and intervening with suicidal ideation. Self-determination theory posits that an individual's sense of competence in activities depends not only on achieving external goals but also requires reinforcement through actual skill improvement. In sports interventions, providing systematic skill training—such as instruction in technical movements and practice methodologies—helps students master athletic skills and improve performance. Meanwhile, timely feedback mechanisms enable students to clearly understand their progress and shortcomings, allowing them to adjust their efforts and boost confidence. Research demonstrates that combining skills training with feedback not only enhances athletic abilities but also reduces psychological stress caused by failure experiences by strengthening competence, thereby lowering the risk of suicidal ideation. Consequently, this approach holds significant practical value in sports intervention programs.

3.3. Exercise Intervention Strategies to Meet Relationship Needs

3.3.1. Organizing Team Sports Activities

Organizing team sports activities creates a conducive environment for interpersonal interaction among students, fulfilling their relational needs and thereby effectively reducing the risk of suicidal ideation[25]. Self-Determination Theory emphasizes that relational needs, as one of the fundamental psychological needs of individuals, are significantly influenced by their satisfaction level in sports contexts on mental health. By providing opportunities for both cooperation and competition, team sports foster communication and emotional connection among students, aiding in the development of positive interpersonal relationships. Research indicates that students participating in team sports score significantly higher in meeting relational needs compared to those engaged in individual sports, and also exhibit better mental health outcomes. Furthermore, achieving collective goals through team activities enhances students' sense of belonging and social support, alleviating negative emotions stemming from interpersonal isolation and emotional emptiness, thus providing crucial psychological support for preventing and intervening in suicidal ideation.

3.3.2. Establishing Sports Social Groups

Establishing sports social groups serves as an effective intervention strategy that fosters emotional connection and mutual support among students, demonstrating positive impacts on preventing and addressing suicidal ideation. Self-Determination Theory posits that fulfilling relational needs relies not only on formal interpersonal interactions but also requires supplementation through informal social activities. Through these groups, students can share athletic experiences and emotional insights in a relaxed environment, thereby cultivating deep friendships. Research indicates that participants in sports social groups score significantly higher than non-participants in terms of loneliness levels and social support, with more stable mental health outcomes. Furthermore, regular group activities enhance students 'sense of belonging and identity, alleviating psychological stress stemming from interpersonal challenges and further reducing the risk of suicidal thoughts. This approach not only addresses students' relational needs but also provides a sustained social support network, holding significant practical value.

4. Research Conclusion

This study, grounded in the theory of self-determination, systematically examines the mechanisms underlying suicidal ideation among college students and proposes targeted behavioral intervention strategies. The research demonstrates that three core components of self-determination theory—autonomy needs, competence needs, and relationship needs—significantly influence the emergence and progression of suicidal thoughts. Specifically, unmet autonomy needs can lead to negative emotions and psychological stress, thereby increasing the risk of suicidal ideation; setbacks in fulfilling competence needs may result in academic and social failure experiences, triggering self-denial and suicidal tendencies; while unmet relationship needs exacerbate interpersonal loneliness and emotional voids, directly contributing to suicidal ideation. Furthermore, the study reveals that these needs not only directly impact suicidal ideation but also indirectly influence its development through mediating variables such as self-efficacy, coping styles, self-esteem, depressive symptoms, social support, and feelings of loneliness.

Based on the aforementioned mechanisms, the exercise intervention strategy proposed in this study demonstrates significant efficacy in preventing and addressing suicidal ideation among college students. By offering opportunities for autonomous choice of exercise activities and developing personalized exercise plans, it effectively addresses students 'autonomy needs while enhancing their motivation for physical activity and psychological resilience; setting tiered exercise goals along with providing skill training and feedback helps improve students' sense of competence and mitigates negative impacts arising from academic and social setbacks; organizing team sports activities and establishing exercise support groups creates a conducive environment for interpersonal interaction, fulfills students' relational needs, and reduces the risk of suicidal ideation. Overall, this study not only enriches the application of self-determination theory in mental health practice but also provides crucial theoretical foundations and actionable intervention strategies for mental health interventions targeting college students.

Acknowledgments

This study was supported by the 2025 College Students' Innovation and Entrepreneurship Training Program of Zhaoqing University (University-Level Project, Grant No. X202510580045).

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