TPM Vol. 32, No. R2, 2025
ISSN: 1972-6325
https://www.tpmap.org/

THE INFLUENCE OF SELF-IMAGE AND MENTAL TOUGHNESS ON ANXIETY AND REDUCING ANXIETY AMONG CHINESE UNIVERSITY STUDENTS THROUGH INTEGRATIVE GROUP COUNSELING

CHENXI RAO[1], PATCHARAPORN SRISAWAT[2], MONTHIRA CHARUPHENG[3]

[1,2,3]Department of Guidance and Educational Psychology, Faculty of Education, Srinakharinwirot University, Thailand
EMAIL: 18771088110@163.com[1*], patcharapom@g.swu.ac.th[2*] AND monthira@g.swu.ac.th[3]

Abstract

This study examined the relationship between mental toughness, self-image, and anxiety among Chinese university students, aiming to identify the most influential predictor of anxiety to guide effective interventions. The rising prevalence of anxiety in university populations, particularly in collectivist societies like China, highlights the importance of internal psychological resources such as mental toughness and self-image for emotional stability. A total of 1,009 students from seven universities in Wuhan were selected through stratified random sampling. Quantitative data were gathered using adapted versions of the Mental Toughness Questionnaire (MTQ48), the Body Self-Image Questionnaire-Short Form, and the Self-Rating Anxiety Scale (SAS). Data were analyzed through descriptive statistics, Pearson's correlation, and multiple regression using SPSS. Findings revealed significant negative correlations between mental toughness and anxiety ($p < 0.001$) and between self-image and anxiety ($p < 0.001$). Multiple regression analysis identified mental toughness as the strongest predictor of anxiety ($R = 0.164$, Adjusted $R^2 = 0.159$, $F = 38.802$, $p < 0.001$). Based on these results, an integrated group counseling program was developed for a purposive sub-sample of students ($n = 20$) with moderate anxiety levels (SAS scores 50–69). The experimental group ($n = 10$) received a 10-session intervention, while the control group ($n = 10$) received no intervention. Post-test analysis showed a significant reduction in anxiety and a significant improvement in mental toughness in the experimental group ($p < 0.001$), with no significant changes in the control group. The study concludes that mental toughness plays a critical, modifiable role in reducing anxiety symptoms among university students. It recommends implementing campus-based integrated counseling programs that enhance mental resilience as a preventive and therapeutic strategy in higher education contexts.

Keywords: Mental resilience, body self-image, anxiety reduction, university mental health, integrated counseling intervention, Chinese higher education

1. INTRODUCTION

In today's era of rapid information dissemination, previously hidden challenges—such as the rising psychological distress among university students—have gained public attention. As the future backbone of society, students' mental well-being is critical to social stability and national development. Yet rising dropout intentions among Chinese university students signal growing concern. In a large-scale survey of 3,648 medical undergraduates, anxiety, depression, and dropout intentions were prevalent at approximately 38.4%, 62.7%, and 39%, respectively, linking mental health struggles directly to academic attrition (Peng et al., 2023). Such trends are consistent with nationwide meta-analyses, which report elevated anxiety and depression rates ranging from about 13.7% for anxiety to nearly 34.7% for depression; across Chinese universities (Gao et al., 2020; Ning et al., 2024). These figures highlight a troubling reality: despite widespread availability of university counseling services, many students do not seek help, exacerbating risks to both individual and societal well-being.

Anxiety is a state of tension, worry, and distress in anticipation of potential threats or adverse outcomes, is among the most common psychological health issues. When anxiety exceeds an individual's coping capacity, it can lead to sleep disturbances, emotional instability, reduced academic performance, and even physical health issues (American Psychiatric Association, 2013). University students, caught in a transitional phase between adolescence and adulthood, face unprecedented stress related to academics, interpersonal relationships, and future career uncertainties. Their limited psychological maturity makes them particularly vulnerable to anxiety with some resorting to dropout as an escape rather than a solution (Ghrouz et al., 2019).

In Chinese universities, counseling centers are common, yet many students suffering from anxiety do not seek help. Moreover, students with anxiety often report dissatisfaction with their physical appearance and health. They are typically introverted, socially withdrawn, and possess poor academic skills and limited coping mechanisms. These factors are closely linked to poor self-image and weak mental toughness, both of which are recognized as major contributors to anxiety. Further, noted that anxiety often distorts self-perception, leading to a negative self-image, particularly among students who place high value on external validation. Similarly, Yu (2016) emphasizes that female students experiencing self-objectification are prone to appearance anxiety due to internalizing societal beauty standards. While, explain that individuals who experienced emotional abuse during childhood tend to develop lower mental toughness, making them more susceptible to anxiety in the face of life's challenges.

Self-image, a multidimensional construct, encompasses perceptions, attitudes, and evaluations of one's identity, abilities, appearance, and social roles (Cash, 2012; Thompson et al., 1999). A positive self-image contributes to greater self-esteem, emotional stability, and better coping abilities, while a negative self-image can lead to low self-worth, anxiety, and depression Self-intention, a component of self-image, plays a key role in shaping motivation and behavior, as individuals are guided by their internal goals and sense of agency (Deci & Ryan, 1985). Mental toughness refers to the capacity to maintain performance and emotional stability under pressure, and includes elements such as perseverance, emotional regulation, and the ability to recover from setbacks (Clough et al., 2002).

Despite a growing body of research on the relationships between self-image, mental toughness, and anxiety, few empirical studies have examined how these variables interact specifically among Chinese university students. Thus, this study aims to fill this gap by analyzing the influence of self-image and mental toughness on anxiety and exploring effective intervention strategies. Understanding the pathways through which these factors affect anxiety is crucial for designing targeted psychological support and reducing dropout rates.

Given the scale of student populations and the rising incidence of anxiety symptoms in Chinese universities, there is a pressing need for efficient and scalable interventions. Integrated group counseling is one such method,

grounded in psychotherapeutic principles and designed to address common psychological challenges through shared group experiences (Chen et al., 2016). This form of counseling leverages group dynamics to facilitate emotional expression, interpersonal learning, and personal growth (He & Fan, 2010). When combined with art psychotherapy; such as dance, music, or drama therapy; integrated group counseling becomes more engaging and expressive. Zheng et al., (2022) describes how clients use visual and creative arts to externalize emotions and work through psychological conflicts, enabling healing and self-understanding.

According to Huang et al., (2024), group therapy allows individuals to re-enact emotional conflicts in a safe setting, enabling cognitive and behavioral change. Further, found that the group activities foster trust and emotional bonding among depressed students, encouraging self-disclosure and mutual support. Moreover, group diversity enhances the learning experience by exposing members to varied perspectives and problem-solving approaches (Zheng et al., 2022).

This study adopted a two-phase approach to examine and address anxiety among university students in Wuhan. In Phase 1, quantitative research was conducted using correlation and regression analyses to explore the influence of self-image and mental toughness on anxiety. A stratified sampling method was employed across four academic years in seven universities, resulting in 1009 valid responses. Based on the findings, Phase 2 implemented a quasi-experimental intervention using integrated group counseling. A purposive sample of 20 students with moderate anxiety (scores between 50 and 69 on the Self-Rating Anxiety Scale) was selected and randomly assigned to either an experimental group, which received counseling structured according to Corey et al., (2006) model, or a control group, which received no intervention. Post-intervention comparisons and follow-up interviews were conducted to evaluate the effectiveness of the counseling program and to gain qualitative insights into its impact.

This study aims to examine the psychological factors associated with anxiety and evaluate the impact of targeted intervention strategies among Chinese university students. It focuses on exploring the relationships between self-image, mental toughness, and anxiety, and assessing the effectiveness of an integrated group counseling program in reducing anxiety and enhancing mental resilience.

1. What is the relationship between self-image, mental toughness, and anxiety among Chinese university students?
2. Which factor—self-image or mental toughness—serves as the strongest predictor of anxiety in this population?
3. How effective is an integrated group counseling program in reducing anxiety and improving mental toughness among Chinese university students?

This research was conducted in two phases:

Phase 1 – Correlational and Predictive Analysis

1. To examine the relationship between self-image, mental toughness, and anxiety among Chinese university students.
2. To determine the predictive strength of self-image and mental toughness on anxiety levels and identify the most influential predictor.

Phase 2 – Quasi-Experimental Intervention

3. To design an integrated group counseling program targeting the key predictor of anxiety identified in Phase 1.
4. To evaluate the effectiveness of the integrated group counseling program in reducing anxiety and enhancing mental toughness among Chinese university students.

This study contributes to the understanding of anxiety by examining its relationship with self-image and mental toughness among university students, providing both theoretical and practical value. The research addresses a notable gap in the literature, as few studies in the Chinese higher education context have simultaneously explored

these two psychological constructs in relation to anxiety while also testing a structured intervention program. Most prior studies have either focused solely on correlational relationships (e.g., between self-image and mental health) or examined mental toughness primarily in sports or Western populations (Lin et al., 2017; Gerber et al., 2018), leaving limited evidence on its predictive role in non-athletic, culturally collectivist university contexts. By identifying mental toughness as the strongest and most modifiable predictor of anxiety, the study advances theoretical understanding and shifts the focus from symptom reduction to resilience building.

The innovation of this research lies in its two-phase design, integrating quantitative correlational and predictive modeling with a quasi-experimental intervention, thereby moving from identification of key predictors to practical application. The implementation of an Integrated Group Counseling (IGC) program specifically targeting mental toughness is novel in the Chinese university context, as existing interventions often address anxiety symptomatically rather than enhancing underlying psychological resources. Moreover, the program's multidimensional framework—drawing on cognitive-behavioral strategies, positive psychology, and group process theory—demonstrated not only immediate but also sustained benefits, addressing the common limitation of short-lived intervention effects.

These findings not only inform targeted interventions for Chinese students but also have cross-cultural applicability to similar populations, such as Thai college students, who face parallel academic, societal, and appearance-related pressures. By filling a methodological and contextual gap and offering an evidence-based, scalable intervention model, this study provides a robust foundation for the development of holistic mental health strategies in higher education systems globally.

2. LITERATURE REVIEW

2.1 Theoretical Perspectives and Manifestations of Anxiety Among University Students

Anxiety is a multifaceted emotional state marked by excessive worry, internal conflict, and physiological symptoms such as tension and fatigue (Hemmings & Bouras, 2017). Unlike fear, anxiety pertains to future threats and may be adaptive or pathological depending on its severity and duration. Theoretical explanations vary: psychoanalytic theory links anxiety to internal conflicts behaviorism views it as a learned response; cognitive theory emphasizes maladaptive thinking patterns and humanistic perspectives attribute it to self-awareness and value conflict. Physiological models cite hyperactive neural responses and hippocampal activity, while social support theory underscores the buffering role of emotional and practical support (Wang, 2004).

According to (Wang & Zhao, 2020), university students are particularly vulnerable to anxiety due to academic, financial, emotional, and social pressures Common forms include exam stress, job market anxiety and relationship-related emotional distress. Factors like fear of evaluation, economic hardship, and academic burnout further exacerbate anxiety. However, Mental toughness and a positive self-image offer protective benefits. Tools such as the Self-Rating Anxiety Scale (Zung, 1971), Beck Anxiety Inventory (Beck et al., 1985), and Hamilton Anxiety Scale (Hamilton, 1959) assess symptom severity and inform treatment. Given its complex roots genetic, psychological, and environmental intervention, cognitive restructuring, and social support are key to mitigating anxiety among university students.

2.2. The Role of Self-Image in Anxiety Among University Students

According to Rosenberg (1965), Self-image is an individual's perception and evaluation of their appearance, personality, and social value, plays a crucial role in shaping emotional stability and self-worth. While, Rogers et al., (1977), rooted in the broader of self-schema concept that it affects attention, memory, and cognition. Negative self-image, often stemming from internalized criticism and unmet ideals, leads to low self-esteem and self-

defeating behaviors. To assess self-image, several validated tools are employed, including the Rosenberg Self-Esteem Scale (RSES), the Multidimensional Body-Self Relations Questionnaire (MBSRQ), the Body Image States Scale (BISS), and the Body-Self Image Questionnaire (BSIQ), each measuring different dimensions of global and appearance-related self-perception (Cash, 2012).

Research consistently finds a significant negative correlation between self-image and anxiety among university students. Individuals with poor self-image frequently exhibit higher trait anxiety, depression, and fear of negative evaluation, particularly in social and appearance-related contexts). Appearance-related anxiety, driven by social comparison and fear of judgment, contributes to emotional distress, depression, compulsive behaviors, and body dissatisfaction (Hawes et al., 2020). Although women typically report lower body satisfaction, both genders are vulnerable to anxiety when there is a conflict between perceived and ideal appearance (Quittkat et al., 2019). Additionally, self-discrepancy, where actual self-perception diverges from ideals or obligations—further increases appearance-related anxiety (Higgins et al., 1987).

2.3 The Role of Mental Toughness in Reducing Anxiety Among University Students

Mental toughness is a fundamental psychological trait that reflects an individual's ability to adapt, persevere, and maintain confidence in the face of stress (Lin et al., 2017). Originally grounded in sports psychology, it has become increasingly relevant in academic and everyday contexts, where it is associated with resilience, emotional control, and mental endurance (Moran, 2012). According to Joneset al., (2002), mental toughness as a set of psychological strengths, either innate or developed, that enable individuals to remain composed, focused, and confident under pressure. While, Clough et al., (2002) identified four core components of mental toughness; control, commitment, challenge, and confidence; forming the basis of the MTQ48, a widely used tool for psychological assessment. And Gucciardi et al. (2009) also highlighted values, emotional regulation, and attitudes as essential factors underpinning this construct, applicable across both athletic and everyday environments. Tools like the SMTQ and MTQ48 are commonly used to assess confidence, resilience, and psychological adaptability among students, offering reliable measures for targeted interventions (Sheard et al., 2009).

A substantial body of research has established a significant inverse relationship between mental toughness and anxiety, especially among university students. Higher levels of mental toughness are consistently linked to lower levels of psychological distress, social anxiety, and academic stress. Students who score higher on mental toughness and resilience measures tend to demonstrate better emotional regulation and more adaptive coping mechanisms, enabling them to manage stress and maintain psychological balance (Gerber et al., 2018). Mental toughness serves as a dynamic buffer against social anxiety and academic stress among students, reflecting the interplay of internal capacities; such as emotion regulation and self-efficacy and external resources like social support. Studies show that MT mediates the impact of stress and physical activity on anxiety, helping students manage adversity and maintain well-being over time (Haghighi & Gerber, 2019).

2.4 Integrated Group Counseling: A Comprehensive Approach to Enhancing Student Psychological Well-being

Integrated group counseling, originally developed within early 20th-century psychoanalytic and humanistic frameworks (Yalom & Leszcz, 2020), has proven to be an effective intervention for improving student psychological well-being, particularly when culturally adapted for collectivist societies like China. By utilizing group dynamics such as peer support, interpersonal learning, and social modeling, group counseling fosters emotional growth, cognitive restructuring, and relational competence (Corey et al., 2006). The cultural emphasis on harmony, social order, and hierarchical relationships in collectivist societies like China aligns well with structured group counseling approaches, making them more acceptable and effective; especially when addressing anxiety, low self-esteem, and interpersonal challenges in university students (Yang, 1998).

Integrated group counseling draws upon a diverse range of psychological theories and creative therapeutic modalities; such as Rational Emotive Behavior Therapy (REBT), Person-Centered Therapy, and Art Therapy is to deliver a multidimensional approach that promotes self-awareness, emotional resilience, and psychological well-being (Ellis & Dryden, 2007; Kramer, 1971).

2.5 Conceptual Framework

The conceptual framework is divided into two phases, as shown in Figure 1. Phase 1 examines the relationship between self-image, mental toughness, and anxiety, aiming to understand how a positive self-perception and resilience can help mitigate anxiety. Phase 2 involves designing and implementing integrated group counseling activities to enhance self-image and mental toughness, enabling participants to develop self-awareness, recognize personal strengths, and apply coping strategies to manage daily stressors. This framework ultimately seeks to reduce anxiety and improve the psychological well-being of university students.

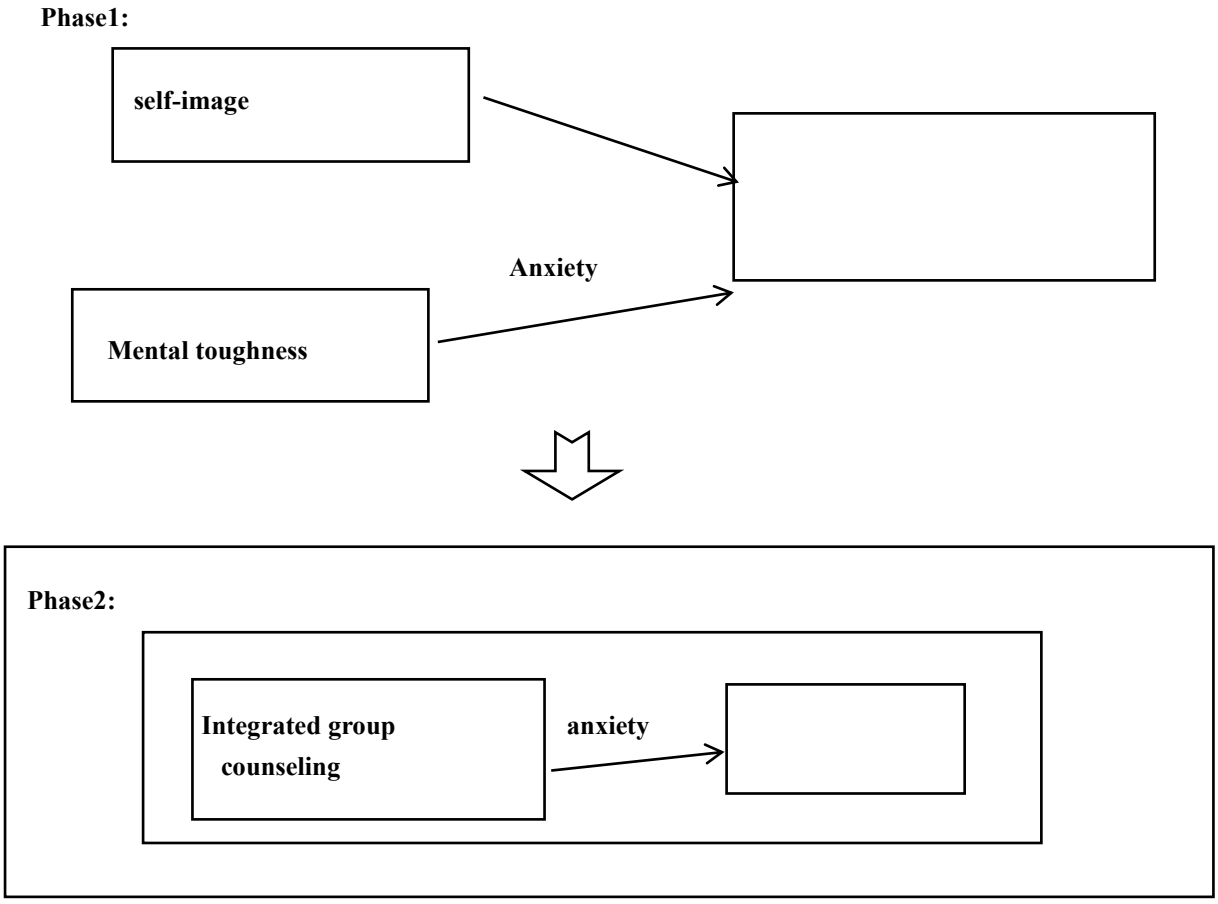

Figure 1 Conceptual framework diagram

2.6 Research Hypotheses

This study aims to examine the impact of self-image and mental toughness on anxiety among Chinese university students and to evaluate the effectiveness of an integrated group counseling program in reducing anxiety. Phase 1 tests two hypotheses: (1) higher levels of self-image and mental toughness are associated with lower anxiety levels, and (2) among these factors, one may serve as a stronger predictor of anxiety. Phase 2 tests the hypothesis that, following participation in the integrated group counseling program, students will show reduced anxiety levels and improved mental toughness compared to their pre-intervention scores.

METHODOLPOGY

Phase 1: Exploring the Impact of Self-Image and Mental Toughness on Anxiety

3.1 Sample Selection and Distribution

In Phase 1, a total of 1009 undergraduate students were randomly selected from a population of 3,874 students enrolled across seven universities in Wuhan, China, spanning first to fourth-year levels. Using the Taro Yamane formula with a 5% margin of error, a minimum sample size of 364 was required; thus, 10.3% of students from each grade and university were proportionally sampled to ensure representativeness. This approach accounted for possible dropout or invalid responses due to incomplete questionnaires. The sample distribution was balanced across disciplines, including arts, nursing, business, urban construction, artificial intelligence, and others ensuring adequate coverage of academic diversity, as summarized in the sample collection table.

3.2 Data collection

After receiving ethical approval, the researchers submitted formal data collection requests to seven universities in Wuhan, China, targeting students from Grades 1 to 4. Proportional stratified random sampling was employed to ensure representation across academic years and institutions. Based on the Taro Yamane formula, the minimum required sample was 364 with a 5% margin of error; however, a total of 1,096 responses were collected, and after excluding incomplete or invalid entries, 1,009 valid questionnaires were retained for analysis. The final sample proportionally reflected each academic grade and university, ensuring the quantitative data were representative and suitable for further statistical testing.

3.3 Research Instruments

This study used three validated instruments to assess anxiety, mental toughness, and self-image among Chinese university students. The Self-Rating Anxiety Scale (SAS) by Zung (1971) includes 20 items (5 reverse-scored) rated on a 4-point scale, with standard scores categorizing anxiety as mild (50–59), moderate (60–69), or severe (70+). The Mental Toughness Questionnaire (MTQ48) measures resilience through 20 items across four dimensions control, commitment, challenge, and confidence rated on a 4-point scale, with total scores indicating low to high mental toughness. The Body Self-Image Questionnaire–Short Form (BSIQ-SF) comprises 27 items across nine dimensions, focusing on body perception, social influence, and physical ideals. All instruments underwent expert review by Chinese and Thai psychologists using the Index of Item-Objective Congruence (IOC), confirming strong content validity.

3.4 Research procedures

Before conducting the questionnaire survey, participants were briefed on the purpose of the study, instructions for completing the survey, estimated time required, and how to address any potential issues. Students accessed the survey by scanning a QR code and completed it online via the Wenjuanxing platform. Upon completion, the data were automatically exported, organized, and securely stored. A total of 1,096 responses were collected, and after screening for incomplete or invalid entries, 1,009 valid questionnaires were retained. Participants were assessed using the Self-Rating Anxiety Scale (SAS), the Mental Toughness Questionnaire (MTQ48), and the Body Self-Image Questionnaire – Short Form (BSIQ-SF). These instruments measured anxiety levels, mental toughness, and body image perceptions, respectively. The collected data were used for subsequent statistical analysis.

3.5 Data Analysis

Quantitative data were analyzed using computer software, employing descriptive statistics, Pearson correlation analysis, and multiple regression analysis to examine the relationships among self-image, mental toughness, and anxiety. Pearson's correlation coefficient was used to assess the strength and direction of linear relationships between self-image, each dimension of mental toughness, and anxiety. Emphasis was placed on both statistical

significance and practical relevance of the correlations. Subsequently, multiple regression analysis was conducted to evaluate the predictive power of self-image and mental toughness on anxiety, with both constructs serving as independent variables and anxiety as the dependent variable. The analysis aimed to quantify the extent to which each predictor contributed to explaining variance in anxiety levels. All results were systematically interpreted to provide a comprehensive understanding of the relationship between self-image, mental toughness, and anxiety.

3.6 Phase 2: Intervention Design and Implementation for Anxiety Reduction

In the second phase, a quasi-experimental design with pre-test, post-test, and follow-up was conducted to evaluate the effectiveness of integrated group counseling in reducing anxiety and enhancing mental toughness among university students. Based on Phase I results, 20 students with SAS scores between 50–69 were purposively selected and randomly assigned to an experimental group (n=10) and a control group (n=10). The experimental group received eight structured integrated group counseling sessions over four weeks, combining elements of CBT, REBT, and mindfulness-based techniques, while the control group received no intervention. Each session followed a structured framework focused on improving self-image and mental toughness through interactive activities. The Self-Rating Anxiety Scale (SAS) was used to assess anxiety levels before, immediately after, and two weeks post-intervention. Group activities were monitored using observation sheets and feedback forms, with session fidelity ensured through trained facilitators. Quantitative data were analyzed using repeated measures ANOVA to identify significant changes across time points and between groups. Results confirmed that integrated group counseling significantly reduced anxiety and enhanced mental toughness in the experimental group compared to the control group, supporting the program's effectiveness as a culturally responsive and scalable intervention for student mental health.

3.7 Ethical Considerations for Human Subjects

All research activities were conducted in accordance with the ethical standards governing human research and received prior approval from the relevant ethics committee. Informed consent was obtained from all participants, ensuring that they were fully aware of the study's purpose, procedures, and their rights. Strict measures were taken to protect participants' privacy and to ensure the confidentiality and security of their data throughout the research process.

RESULTS AND ANALYSIS

Phase I: The Impact of Body Self-Image and Mental Toughness on Anxiety Among Chinese University Students

4.1 **Demographic Characteristics of the Sample**

Table 1 shows that the sample comprised 1,009 valid responses from university students at Wuchang Institute of Technology, collected via the Wenjuanxing platform, with a valid response rate of 92.06%. The majority of respondents were female (67.99%), and most were freshmen (45.00%) or sophomores (48.27%). In terms of family structure, 45.79% had one sibling, while 36.97% were only children. Urban residents made up the largest proportion (55.1%), followed by those from counties (18.04%), towns (17.34%), and villages (9.51%). Monthly living expenses ranged mostly between 1,001–2,000 RMB (58.97%). Regarding psychological counseling experience, 47.37% had never received counseling, 34.29% indicated no counseling center at their college, 14.77% had used counseling services, and 3.57% had never heard of such services. The sample was drawn from various colleges, with the highest representation from the School of Artificial Intelligence (25.89%) and the lowest from the College of Art and Design (7.85%). This demographic profile highlights a diverse student body,

predominantly young, female, urban, and from multi-child families; factors that may influence psychological variables such as anxiety, mental toughness, and body image, which are key areas for further analysis.

Table 1 Demographic characteristics of the sample (n = 400)

Items		Frequency	Percent
Gender	Male	323	32.01
	Female	686	67.99
Education	Freshman(Y1)	454	45.00
	Sophomore(Y2)	487	48.27
	Junior(Y3)	8	0.79
	Senior(Y4)	60	5.95
How many brothers and sisters do you have?	Have no brothers or sisters	373	36.97
	A sibling	462	45.79
	Two siblings	116	11.5
	Three or more	58	5.75
Usually Live	City	556	55.1
	Town	175	17.34
	County	182	18.04
	Village	96	9.51
Monthly Expenses	500 to 1000 RMB	89	8.82
	1001 to 2000 RMB	595	58.97
	2001 to 3000 RMB	52	24.58
	Above 3001 RMB	25	5.15
Does your college have a Counseling Center	Yes, I have counseling before.	149	14.77
	Yes, I haven't had counseling before.	478	47.37
	No	346	34.29
	I haven't heard of it	36	3.57
Professional	College of Art and Design	79	7.85
	College of Film and Television Media	104	10.33
	College of Literature and Law	118	11.76
	College of Nursing	129	12.79
	Business School	148	14.69
	College of Urban Construction	170	16.69
	School of Artificial Intelligence	261	25.89

4.2 Descriptive Analysis of Variables

Table 2 shows that tha descriptive analysis of 400 Chinese college students reveals that the average anxiety (SA) score is 27.63 (SD = 3.77), indicating a generally low and stable level of anxiety among the sample. Mental toughness (MT) has a mean of 61.14 (SD = 11.34), suggesting a moderately high level with noticeable individual differences, implying that some students may benefit from resilience-building interventions. Body self-image (BS) shows a mean of 96.37 (SD = 8.84), reflecting a generally positive perception with relatively low dispersion. The data quality is high, with no signs of extreme variability, and the distribution appears suitable for further correlation and regression analysis. These results suggest that while the overall psychological state is healthy, individual variability in mental toughness and self-image may influence anxiety outcomes.

Table 2 Descriptive statistics of the variables under study

Variable name	M	S.D	Level
Mental toughness (MT)	61.14	11.343	Medium
Self-image(BS)	96.37	8.844	high
Anxiety(SA)	27.63	3.766	Low

4.3 Correlation Analysis of Variables

Table 3 shows that The Pearson correlation analysis among 400 Chinese college students shows that mental toughness (MT) is significantly positively correlated with body self-image (BS) ($r = 0.381$, $p < 0.001$), indicating that individuals with higher mental resilience tend to have a more positive perception of their physical appearance. Mental toughness also has a moderate negative correlation with anxiety (SA) ($r = -0.396$, $p < 0.001$), suggesting that greater resilience is associated with lower anxiety levels. Additionally, body self-image is weakly but significantly negatively correlated with anxiety ($r = -0.225$, $p < 0.001$), implying that students with a more positive self-image generally report lower anxiety. These results highlight the protective role of mental toughness against anxiety and suggest that improving body image may also help reduce anxiety, supporting the use of these variables in targeted psychological interventions and predictive models.

Table 3 anxiety and mental toughness and Pearson correlation result of self-image(n = 400)

Variable name	M	S.D	Level
SA (Anxiety)	1.00		
MT (Mental toughness)	-0.396**	1.00	
BS (Self-image)	-0.225**	0.381**	1.00

**. Correlation is significant at the 0.01 level (two-tailed).

4.4 Regression Model of Variables

The multiple regression analysis revealed that mental toughness (MT) and body self-image (BS) significantly predict anxiety (SA) among Chinese college students. As shown in Table 4, the overall regression model is statistically significant, $F(2, 397) = 38.802$, $p < 0.001$, confirming that the model reliably explains variations in anxiety levels. Together, MT and BS account for 16.4% of the total variance in anxiety, indicating a moderate effect size. This suggests that both higher mental toughness and a more positive self-image are associated with lower anxiety levels, reinforcing their relevance as key psychological factors in anxiety reduction interventions.

Table 4 Summary of the regression model of Mental toughness, self-image and Anxiety factors(n = 400)

Model	SS	Df	MS	F	P
regression	925.369	2	462.684	38. 802*	0.001
Residual error	4733.871	397	11.924		
Total	5659.240	399			

a.Dependent variable ： SA

b.Independent variables (Constant)： MT, BS

Annova Analysis

The ANOVA results in Table 5 indicate that mental toughness (MT) is a significant negative predictor of anxiety (SA), with a standardized regression coefficient of $\beta = -0.364$ ($p < 0.001$), suggesting that higher mental toughness

is associated with lower anxiety levels. In contrast, body self-image (BS) does not significantly predict anxiety, with a weaker and statistically non-significant coefficient (β = -0.086, p = 0.084). The regression equation, SA = 38.541 - 0.121×MT - 0.037×BS, further supports that MT plays a more critical role in explaining variations in anxiety. Multicollinearity was not a concern, as the correlation between MT and BS (r = 0.381) was well below the 0.80 threshold, confirming the model's reliability for interpretation.

Table 5 mental toughness and self-image anova table(n = 400)

Variable	B	SE	B	t	p
Constant	38.541	1.906	—	20.223*	0.001
BS	-0.037	0.021	-0.086	-1.732	0.084
MT	-0.121	0.016	-0.364	-7.325	0.001

4.5 Regression Model Diagram and Path Explanation Suggestions

The regression path diagram illustrates in figures 2, shows the directional relationships between mental toughness (MT), body self-image (BS), and anxiety (SA), highlighting the differing levels of influence each predictor has on anxiety. Mental toughness exhibits a significant negative effect on anxiety, with a standardized regression coefficient of β = -0.364 (p < 0.001), indicating that as mental toughness increases, anxiety levels tend to decrease markedly. Conversely, body self-image shows a weak and statistically non-significant negative association with anxiety (β = -0.086, p = 0.084), suggesting its influence on anxiety is minimal and may not hold substantial predictive value in this context. This model effectively explains the psychological framework influencing anxiety and offers a clear foundation for future intervention strategies, emphasizing the importance of enhancing mental toughness as a primary target for reducing anxiety symptoms.

The regression path relationships in this study can be simplified as follows:

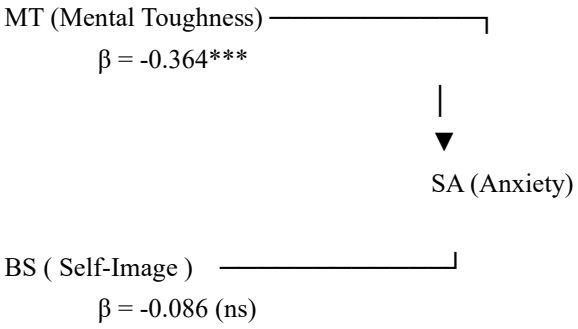

Figure 2 The regression path relationship can simplify the graph

2 Phase Two: A Integrative Group Counseling Program to Alleviate Anxiety Among Chinese University Students

4.6 Demographic Statistics

In the first phase of the study, 20 students with anxiety scores between 50 and 69 were randomly selected from a pool of 400 respondents. All participants voluntarily agreed to join the quasi-experimental study. These students were randomly assigned to either an experimental group (n = 10) or a control group (n = 10). The demographic characteristics of the experimental group are detailed in the table below.

a. Demographic Characteristics of the Experimental Group

As shown in Table 6, the experimental group consisted of 10 students who voluntarily participated in the study. Among them, 20% were male and 80% were female. Regarding family structure, only 10% of the participants were only children, while the remaining 90% had one or more siblings. Notably, none of the students had

previously visited the school's psychological counseling center, although 90% were aware of its existence. In terms of academic background, participants came from diverse faculties: 10% from the College of Art and Design, 20% from the College of Film and Television Media, 10% from the College of Literature and Law, 30% from the College of Nursing, and 30% from the Business School. These demographic characteristics provide a varied representation of students across disciplines and family backgrounds, relevant for understanding different perspectives on anxiety and intervention outcomes.

Table 6 demographic characteristics of control group (n = 10).

Items		Frequency	Percent
Gender	Male	2	20
	Female	8	80
Number of Siblings	No brother or sister	1	10
	One sibling	7	70
	Two siblings	2	20
Does the school have a psychological counseling center	Yes, but I haven't been there	9	90
	No	1	10
College	College of Art and Design	1	10
	College of Film and Television Media	2	20
	College of Literature and Law	1	10
	College of Nursing	3	30
	Business School	3	30

b. **Demographic Characteristics of the Control Group**

As shown in Table 7, the control group comprised 10 students who voluntarily participated in the study. Of these, 20% were male and 80% were female. In terms of family background, 30% were only children, 50% had one sibling, and 20% had two siblings. Regarding experience with psychological counseling, 20% of the participants had previously visited the school's psychological counseling center, while 80% had never sought such services. The participants represented a diverse academic background: 20% were from the College of Film and Television Media, 10% from the College of Nursing, 20% from the Business School, 20% from the College of Urban Construction, and 30% from the School of Artificial Intelligence. These demographic features reflect a varied student profile, contributing to a balanced comparison in the quasi-experimental design.

Table 7 demographic characteristics of control group (n = 10).

Items		Frequency	Percent
Gender	Male	2	20
	Female	8	80
Number of Siblings	No brother or sister	3	30
	One sibling	5	50
	Two siblings	2	20
Does the school have a psychological counseling center	Yes, and I have been to the psychological counseling center	2	20
	Yes, but I haven't been there	8	80
	No	1	10
College	College of Film and Television Media	2	20
	College of Nursing	1	10
	Business School	2	20

	College of Urban Construction	2	20
	School of Artificial Intelligence	3	30

4.8 Descriptive Statistics of Each Factor in the Experimental and Control Groups

Table 8 presents the descriptive statistics for anxiety, mental toughness, and self-image across the pre-test, post-test, and follow-up phases for the experimental group. The average anxiety score was at a moderate level before the intervention (M = 3.54), dropped significantly to a low level after the intervention (M = 2.40), and remained low during the follow-up phase (M = 2.46), indicating sustained improvement. Mental toughness initially scored low (M = 1.89) but increased to a moderate level after the intervention (M = 3.23) and remained stable in the follow-up (M = 3.13), reflecting enhanced psychological resilience. Self-image showed a slight improvement from the pre-test (M = 2.89) to post-test (M = 2.98), maintaining a high level, but declined to a moderate level in the follow-up phase (M = 2.43), suggesting some reduction in perceived self-worth over time. Overall, the intervention positively impacted anxiety and mental toughness, with mixed results on self-image over time.

Table 8 Descriptive of Anxiety, Mental toughness and self-image in the experimental group (n =10)

Variable	Pretest		Post-test			Follow-up			
	M	S.D.	Levels	M	S.D.	Levels	M	S.D.	Levels
Anxiety	3.54	0.51	Moderate	2.40	0.45	low	2.46	0.54	low
Mental toughness	1.89	0.67	Low	3.23	0.28	Moderate	3.13	0.37	Moderate
Self-image	2.89	0.32	High	2.98	0.36	high	2.43	0.48	Moderate

Table 9 summarizes the descriptive statistics for anxiety, mental toughness, and self-image across the three measurement phases for the control group. Anxiety levels remained consistently moderate throughout the study, with minimal change from pre-test (M = 3.34) to post-test (M = 3.22) and follow-up (M = 3.26), indicating no significant reduction without intervention. Mental toughness showed a slight decline after the post-test (M = 2.68) and a marginal increase in the follow-up phase (M = 2.56), suggesting only minor natural fluctuations. Self-image remained consistently high across all phases (M > 2.9), demonstrating stability over time and resistance to change in the absence of an intervention. Overall, the control group exhibited no meaningful improvements in any of the three variables measured.

Table 9 Descriptive of Anxiety, Mental toughness and self-image in the control group (n =10)

Variable	Pretest		Post-test			Follow-up			
	M	S.D.	Levels	M	S.D.	Levels	M	S.D.	Levels
Anxiety	3.34	0.27	Moderate	3.22	0.22	low	3.26	0.24	Low
Mental toughness	2.88	0.35	Low	2.68	0.68	Moderate	2.56	0.31	Moderate
Self-image	3.15	0.46	High	3.21	0.21	high	2.92	0.35	Moderate

4.9 Repeated Measures Analysis of Differences Across Pre-test, Post-test, and Follow-up Phases

The repeated measures ANOVA results in table 10, demonstrated the significant effectiveness of the group counseling intervention on improving mental toughness and reducing anxiety over time. All four multivariate test

statistics (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root) were highly significant ($p < 0.001$), indicating the overall model's validity. The main effects of group and time were both significant, with large effect sizes ($\eta^2 = 0.895$ for group and $\eta^2 = 0.953$ for time), showing that differences existed between the experimental and control groups and that participants' scores changed meaningfully across the three phases. Most importantly, the interaction effects between time and group were statistically significant with very large effect sizes ($\eta^2 = 0.962$), revealing that the experimental group experienced substantial and sustained improvements in mental toughness and reductions in anxiety due to the counseling intervention, while the control group showed no meaningful change. These results confirm the intervention's practical value and long-term psychological benefits.

Table 10 Significant results of between-subject and within-subject effects of pretest, post-test, and follow-up related factors in the experimental group and control group.

	Effect	Value	F	Df (hypothesis)	(error)	P	η2
Between-Subjects	**Intercept**						
	Pillai's Trace	0.998	10522.681	2.000	17.000	0.001	0.998
	Wilks' Lambda	0.002	10522.681	2.000	17.000	0.000	0.998
	Hotelling's Trace	1238.198	10522.681	2.000	17.000	0.000	0.998
	Roy's Largest Root	1238.198	10522.681	2.000	17.000	0.000	0.998
	Group						
	Pillai's Trace	0.895	72.448	2.000	17.000	0.000	0.895
	Wilks' Lambda	0.105	72.448	2.000	17.000	0.000	0.895
	Hotelling's Trace	10.013	72.448	2.000	17.000	0.000	0.895
	Roy's Largest Root	10.013	72.448	2.000	17.000	0.000	0.895
Within-Subjects	**Time**						
	Pillai's Trace	0.953	82.371	4.000	15.000	0.000	0.953
	Wilks' Lambda	0.047	82.371	4.000	15.000	0.000	0.953
	Hotelling's Trace	22.230	82.371	4.000	15.000	0.000	0.953
	Roy's Largest Root	22.230	82.371	4.000	15.000	0.000	0.953
	Time*						
	Pillai's Trace	0.962	95.714	4.000	15.000	0.000	0.962
	Group Wilks' Lambda	0.038	95.714	4.000	15.000	0.000	0.962
	Hotelling's Trace	26.159	95.714	4.000	15.000	0.000	0.962
	Roy's Largest Root	26.159	95.714	4.000	15.000	0.000	0.962

4.10 Simple Effect Analysis of Mental Toughness Between the Experimental and Control Groups

The simple effect analysis presented in Table 11 clearly demonstrates the significant and lasting impact of the intervention on mental toughness in the experimental group compared to the control group. At the pretest stage, no significant difference was observed between the two groups (M.D. = 0.10, $p = 0.927$), confirming that both started at a comparable baseline. However, following the intervention, the experimental group showed a substantial increase in mental toughness scores at the post-test phase (M.D. = 6.50, $p < 0.001$), indicating the effectiveness of the counseling sessions. This positive effect continued to strengthen, as seen in the follow-up results where the mean difference further widened (M.D. = 9.70, $p < 0.001$), suggesting that the gains in mental

toughness were not only sustained but also grew over time. These findings affirm that the intervention led to a significant and enduring enhancement in the mental resilience of participants in the experimental group.

Table 11 Comparison of Mental toughness at each time point in each group

Variable	Time	Group	Group	M.D.	S.E.	P
Mental	Pretest	EG	CG	0.10	1.431	0.927
toughness	Post-test	EG	CG	6.50*	0.795	0.001
	Follow-up	EG	CG	9.70*	0.869	0.001

*Note: Bold values indicate significant at *p < 0.001*

4.11 Simple Effect Analysis of Anxiety Levels Between the Experimental and Control Groups

The simple effect analysis of anxiety levels in Table 12 reveals a clear and sustained impact of the intervention on reducing anxiety in the experimental group compared to the control group. At the pretest stage, there was no significant difference between the two groups (M.D. = 0.170, p = 0.867), indicating a comparable baseline level of anxiety. However, after the intervention, the experimental group reported significantly lower anxiety scores in the post-test (M.D. = -8.70, p < 0.001), reflecting the short-term effectiveness of the intervention. This reduction was further amplified in the follow-up phase (M.D. = -13.400, p < 0.001), indicating that the positive effects were not only maintained but had also deepened over time. These results confirm that the intervention led to a significant, long-lasting reduction in anxiety levels, demonstrating its strong therapeutic impact on the experimental group.

Table 12 Comparison of anxiety levels at each time point in each group

Variable	Time	Group	Group	M.D.	S.E.	P
Anxiety	Pretest	EG	CG	0.170	0.849	0.867
	Post-test	EG	CG	-8.70*	1.371	0.001
	Follow-up	EG	CG	-13. 400*	1.231	0.001

*Note: Bold values indicate significant at *p < 0.001*

4.12 Simple Effects Repeated Measures Analysis of Anxiety

The repeated measures analysis of anxiety levels presented in Table 13 highlights the effectiveness and sustainability of the intervention over time. Within the experimental group, anxiety levels significantly decreased from pretest to post-test (M.D. = -1.14, p < 0.001) and from pretest to follow-up (M.D. = -2.08, p < 0.001), indicating that the intervention produced a substantial and lasting reduction in anxiety. However, the non-significant difference between post-test and follow-up scores (M.D. = +0.06, p = 0.610) suggests that the reduced anxiety level was maintained over time. In contrast, the control group exhibited no significant changes in anxiety across any time periods, confirming that the observed improvements in the experimental group were due to the intervention rather than natural variation. Overall, the results affirm that the intervention had a significant and enduring positive effect on reducing anxiety.

Table 13 shows the differences in anxiety and its influencing factors before the test, after the test and during the follow-up period (pairwise comparisons across time periods).

Variable	Group	Period	M.D.	S.E.	t	P
Anxiety	EG	Post-test-Pretest	-1.14	0.128	-8.91*	0.001
		Follow-up-Pretest	-2.08	0.244	-8.52*	0.001

	Follow-up-Posttest	+0.06	0.114	+0.52	0.610
CG	Post-test-Pretest	-0.12	0.110	-1.04	0.304
	Follow-up-Pretest	-0.08	0.113	-0.69	0.498
	Follow-up-Posttest	+0.04	0.101	+0.39	0.699

Note: $p < 0.001$

4.13 Simple Effects Repeated Measures Analysis of Mental Toughness

The repeated measures analysis of mental toughness as shown in table 14, revealed that the experimental group experienced a significant increase in mental toughness from pre-test to post-test and from pre-test to follow-up ($p < 0.001$), demonstrating the effectiveness of the intervention. The absence of a significant difference between the post-test and follow-up scores ($p = 0.315$) indicates that the improvement was sustained over time. In contrast, the control group showed no significant changes in mental toughness from pre-test to post-test or from pre-test to follow-up, except for a slight increase between follow-up and post-test ($p = 0.004$), which was not sufficient to suggest a meaningful change. These results confirm that the intervention led to a lasting enhancement in mental toughness in the experimental group, while no such improvement was observed in the control group, ruling out the possibility of natural change and supporting the intervention's long-term effectiveness.

Table 14 shows the differences in Mental toughness before the test, after the test and during the follow-up period, as well as their influencing factors (pairwise comparisons across time periods).

Variable	Group	Period	M.D.	S.E.	t	P
Anxiety	EG	Post-test-Pretest	+1.34	0.126	+10.63*	0.001
		Follow-up-Pretest	+2.24	0.136	+16.47*	0.001
		Follow-up-Posttest	-0.10	0.096	-1.02	0.315
	CG	Post-test-Pretest	-0.20	0.118	-1.60	0.115
		Follow-up-Pretest	+0.15	0.132	+1.12	0.271
		Follow-up-Posttest	+0.35	0.106	+3.00	0.004

Note: $p < 0.001$

Comparisons of anxiety and mental toughness between the experimental and control groups at the pre-test, post-test, and follow-up phases are shown in Figures 3 and 4 below.

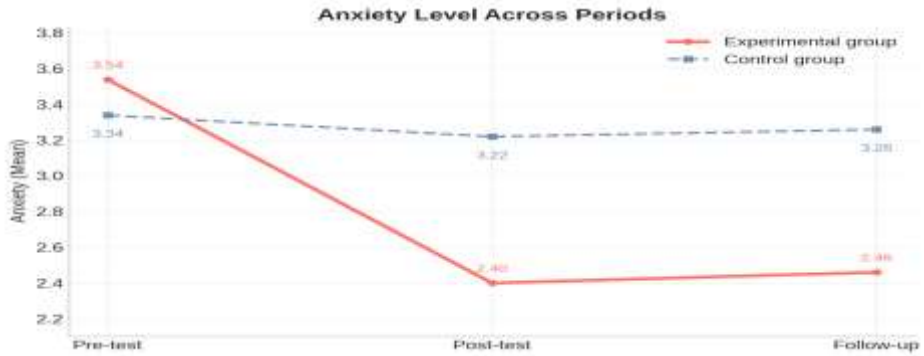

Figure 3 Anxiety Level Across Periods

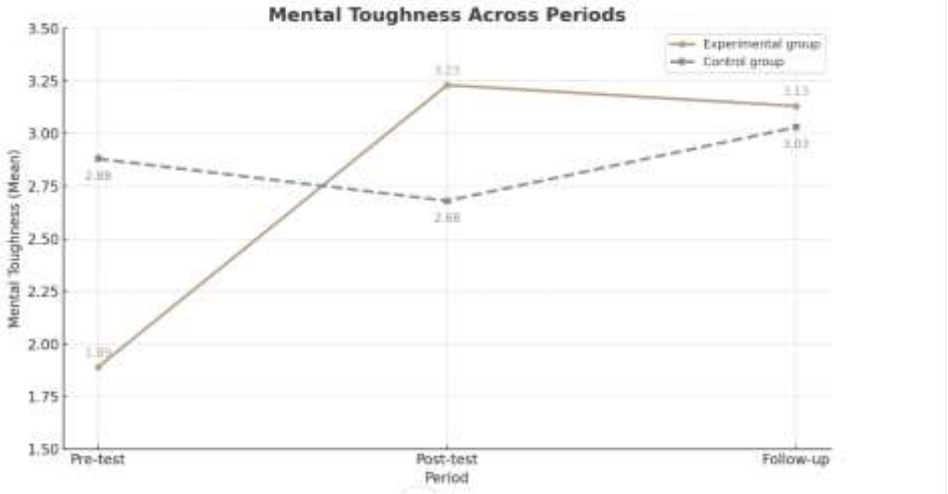

Figure 4 Mental Toughness Across Periods

DISCUSSION

The first phase of this research examined whether self-image and mental toughness predicted anxiety among Chinese university students. The findings strongly supported Hypothesis 1, demonstrating that mental toughness ($\beta = –0.364$, $p < 0.001$) was a significant negative predictor of anxiety. This aligns with prior studies highlighting mental toughness as a psychological buffer against emotional distress and a contributor to resilience (Gucciardi et al., 2009; Gerber et al., 2018; Haghighi & Gerber, 2019). The multidimensional structure of mental toughness—comprising challenge, commitment, control, and confidence (Clough et al., 2002; Jones et al., 2007)—explains its stronger predictive power. Each dimension contributes uniquely to stress regulation: reframing difficulties as opportunities (challenge), maintaining persistence toward goals (commitment), regulating emotional responses (control), and sustaining self-belief (confidence).

Although self-image had a negative relationship with anxiety, it was not statistically significant ($\beta = –0.086$, $p = 0.084$), partially supporting Hypothesis 2. This suggests that self-image may exert an indirect influence, potentially mediated by self-esteem (Rosenberg, 1965), social support (Wang, 2004), or self-discrepancy perceptions (Higgins, 1987). The qualitative data reinforced these patterns: mentally tough students reported adaptive coping strategies such as problem-solving, exercise, and time management, while students with low self-image exhibited maladaptive responses, including avoidance and social withdrawal. These tendencies are consistent with cognitive-behavioral perspectives on body image (Cash, 2012) and recent findings on appearance-related anxiety in young adults (Hawes et al., 2020; Quittkat et al., 2019).

Cultural factors, especially within the collectivist context of Chinese society, appeared to magnify these dynamics. Female students, in particular, faced intersecting pressures relating to academic achievement and physical appearance, mirroring earlier findings on appearance anxiety in Chinese female students (Yu, 2016; Ning et al., 2024). This cultural lens supports Yang's (1998) assertion that modernization in East Asia often intensifies both achievement and conformity pressures, with psychological consequences.

The second phase tested Hypotheses 3 and 4, assessing the effects of an Integrated Group Counseling (IGC) intervention on anxiety and mental toughness. Results provided strong support for both hypotheses. The experimental group experienced a substantial reduction in anxiety (pre-test M = 3.54 to post-test M = 2.40; follow-up M = 2.46) and a marked improvement in mental toughness (pre-test M = 1.89 to post-test M = 3.23; follow-up

M = 3.13), while the control group remained largely unchanged or declined. These improvements were statistically significant ($p < 0.001$) and sustained over time, consistent with previous research on the efficacy of structured group counseling and cognitive-behavioral approaches in reducing anxiety symptoms (Chen et al., 2016; He & Fan, 2010; Wang et al., 2025; Huang et al., 2024).

The intervention's success can be attributed to its multidimensional design, integrating cognitive-behavioral therapy (Ellis & Dryden, 2007), positive psychology principles, and group process dynamics (Yalom & Leszcz, 2020). By targeting the four core components of mental toughness, the program likely enhanced students' emotional regulation, cognitive reframing skills, and self-efficacy. The sustained post-intervention effects echo findings by Lin et al. (2017) and Gerber et al. (2018), suggesting that mental toughness training not only mitigates immediate symptoms but also builds enduring psychological resources that buffer future stress.

Overall, these results confirm mental toughness as a key protective factor against anxiety in the Chinese higher education context, with integrated counseling interventions offering an effective, sustainable strategy for student mental health promotion. The findings also underscore the importance of culturally tailored interventions that address both performance pressures and body image concerns to maximize preventive and therapeutic outcomes.

5.CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion of the study

This study provides comprehensive evidence that mental toughness is a key determinant of anxiety regulation among university students**,** while self-image plays a comparatively minor and indirect role. Across both phases of the research, mental toughness consistently demonstrated a strong negative predictive relationship with anxiety ($\beta = -0.364$, $p < 0.001$), confirming that students with higher resilience in the dimensions of challenge, commitment, control, and confidence are more capable of managing psychological pressure. In contrast, self-image, though negatively correlated with anxiety, did not reach statistical significance as a direct predictor, suggesting its influence may occur indirectly through mediators such as self-esteem, social support, or cognitive appraisal.

The Integrated Group Counseling (IGC) intervention proved to be highly effective in achieving the study's objectives. Quantitative results demonstrated that participants in the experimental group experienced a significant and sustained reduction in anxiety (from M = 3.54 pre-test to M = 2.40 post-test, remaining low at follow-up) and a marked increase in mental toughness (from M = 1.89 pre-test to M = 3.23 post-test, with stable follow-up scores). In contrast, the control group showed minimal change across all time points. Paired-sample t-tests and repeated-measures analyses confirmed the stability and persistence of the intervention effect**,** indicating that IGC not only produced immediate psychological benefits but also maintained them over time.

Overall, this study concludes that mental toughness is a central protective factor against anxiety, and that structured, multidimensional psychological interventions such as Integrated Group Counseling are effective in enhancing resilience and reducing psychological distress among university students. The sustained effects observed in the follow-up phase indicate the practical value and long-term applicability of this approach in higher education settings. These findings provide theoretical enrichment to mental toughness research in the Chinese context and offer practical guidance for universities to develop systematic mental health programs, integrating cognitive-behavioral strategies, mindfulness, and group-based support to strengthen students' psychological resources and academic adaptability.

5.2 Implication of the study

Universities should establish mental toughness enhancement systems using cognitive-behavioral techniques and growth mindset frameworks centered on the four core dimensions: Confidence, Challenge, Control, and Commitment. Counseling centers should offer targeted interventions on self-image, including body image acceptance and social confidence building. Educators should be encouraged to support students' emotional development and foster positive self-evaluations beyond academics. Institutions are also advised to introduce interdisciplinary courses; such as "Digital Health and Psychological Adjustment" and "AI-Assisted Learning and Emotional Regulation" to strengthen students' coping mechanisms against academic and tech-related stress. Finally, group counseling programs should incorporate structured, experience-based methods like mindfulness, emotional labeling, and scenario-based decision-making to enhance intervention impact and realism.

5.3 Recommendations

This study empirically validated the critical role of mental toughness in regulating anxiety among Chinese university students, contributing to the localized development of mental toughness theory and informing psychological intervention frameworks in higher education. Although self-image did not statistically predict anxiety, qualitative data suggest its indirect influence through self-esteem, cognitive appraisal, and coping strategy development—warranting further exploration via mediation or moderation models. The findings also emphasize the mediating role of positive coping strategies (e.g., help-seeking, problem-solving) in anxiety regulation, aligning with emotional regulation theory and the conservation of resources model. Moreover, the study highlighted the emerging value of digital tools, such as AI (e.g., ChatGPT), in mitigating technology-induced stress, broadening the theoretical landscape to integrate psychological well-being with technological adaptation.

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