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Enhancing mental flexibility: The effect of a training program based on the concept of physical self and psychological adaptation among secondary school students in Al-Ahsa

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Abstract

The research focused on developing structured methods to improve mental toughness as a critical tool for addressing academic challenges and promoting psychological adaptation. This study aimed to investigate the effectiveness of a mental toughness training program in enhancing physical self-understanding and psychological adjustment among university students at the College of Education, King Faisal University, Saudi Arabia. The study employed an experimental approach. The final sample consisted of 56 students, divided equally into experimental and control groups. Data collection relied on standardized questionnaires designed to assess mental toughness, physical self-concept, and psychological adjustment. The results revealed significant improvements in the experimental group compared to the control group across all measured variables. The findings underscore the importance of integrating mental toughness training programs into educational settings to foster holistic development among university students. Such programs enhance both psychological resilience and physical self-awareness, equipping students to better manage stress, improve academic performance, and achieve long-term personal growth. Future research should explore the sustainability of these effects and expand the scope to include diverse populations and contexts. This study provides valuable evidence supporting the role of mental toughness as a foundational skill for modern education and serves as a basis for designing similar interventions tailored to specific needs. By combining structured training with innovative approaches, universities can create supportive environments that promote resilience, confidence, and adaptability among students.

Keywords: Challenge, Coping Efficacy, Mental Toughness, Physical Self-Concept, Psychological Adaptation, Self-Esteem, Social Integration.

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1. Introduction

The psychological development of university students requires essential preparation because it improves their capabilities to execute academic tasks and fulfill public responsibilities. Students who receive psychological preparation develop advanced cognitive abilities and talent skills, which are vital for facing globalization challenges [1]. Mental toughness (MT) represents a general term including positive psychological resources that work across achievement settings [2, 3]. An individual with high confidence in personal capabilities can actively seek growth opportunities, and these opportunities become visible because of stressors' reappraisal as developmental chances [4]. Mental toughness stands out as an essential psychological quality that helps people work toward their objectives during stressful situations. This idea stands central in both sports and high-pressure jobs because maintaining concentration and bouncing back enhances performance success. Mental toughness consists of mental traits for resilience alongside determination and composure, which help people face obstacles, together with interpersonal traits including leadership qualities and emotional intelligence primarily needed for successful teamwork [5]. Stress management combines with motivation and commitment as components of mental toughness, which demonstrates various functional uses [6].

According to Guzmán-Muzante, et al. [7] mental toughness represents the capability of people to continue striving toward their objectives while coming across numerous types of pressure. The acquired skills of constructive positive thinking and problem-solving comprise mental toughness, which develops emotional and mental strength to manage physical and mental pressures along with emotional pressures [8]. A person who possesses mental hardness can accomplish their personal objectives when subjected to multiple forms of pressure [9]. The capability to resolve problems aims to establish emotional and mental strength, helping people deal with physical, mental, and emotional demands through developing trust and stability, thus resulting in increased interaction [10]. Jang, et al. [11] emphasized both the significance of pressure management experiences along with their strategic role in mental hardness development. Study by Aditya, et al. [6] together with Julianty, et al. [12] and Kumbar and Patil [13] has revealed that mental toughness generates positive outcomes in athlete performance satisfaction apart from lowering stress while reducing anxiety and boosting social interaction. According to Aditya, et al. [6] people with mental toughness perform best in any competitive situation since self-concept drives this ability. Ojio, et al. [14] and Julianty, et al. [12] documented meaningful positive relationships between mental toughness and psychological well-being, which led to enhanced performance among their tested participants. According to Loher [15] mental hardness generates positive effects that enable training since it promotes performance satisfaction while reducing stress, tension, and anxiety and encouraging social interaction. Golby and Wood [16] demonstrate mental hardness serves as a distinct positive psychological construct that boosts positive psychological conditions, thus creating strong justification for additional investigation into mental hardness development within adverse mental settings. According to Mutz, et al. [17] the nature of mental hardness relies on self-concept, but athletes can achieve ideal performance goals regardless of competitive circumstances. The findings from Miçoogullari and Ekmekçi [18] established that participants displayed high levels of performance with both mental hardness and psychological skill training connected to improved mental health.

Physical self-perception acts as a vital framework for understanding body and ability evaluation since many people experience differences between personal and external body perception. People evaluate their body shape and physical skills through physical self-perception, yet these assessments regularly vary markedly from what society along believes Gosteva [19]. The research by Gosteva [19] establishes that female students show intricate relationships between their sense of self and body-awareness leading to social effects on their mental wellness and interpersonal relationships. People who view themselves negatively will experience bodily anxiety along with physical discomfort that creates negative impacts on life quality.

The physical self-concept displays vital importance in adolescent growth because body image perceptions and pubertal physical changes deeply affect this development sphere. Based on Kartikasari, et al. [20] body image dissatisfaction affects 92.5% of girls during adolescence, while nearly all adolescents have negative physical appearance self-concepts, particularly among girls. The reasons for bodily dissatisfaction span from fitness levels and Body Mass Index (BMI) measurements to various other variables. Studies conducted by Guilherme, et al. [21] show that students who have lower fitness levels generally have worse satisfaction regarding their body image, which proves how physical health affects self-perception. The research by Ferro, et al. [22] revealed that young individuals undergoing both physical and mental health complications and older individuals show notably decreased physical self-concept scores according to their findings. The research demonstrates how physical health together with mental health continuously influence how adolescents view themselves. The study by Chernyakova, et al. [23] and Galán-Arroyo, et al. [24] emphasize that educational and health initiatives must develop positive self-perceptions due to adolescents' heightened self-awareness. These interventions work to reduce body dissatisfaction effects and enhance both mental and physical health advancement among students in this vital developmental stage.

The evaluation one holds about themselves affects both mental health and physical wellness significantly, particularly when the assessment concerns body appearance. Research shows that feeling dissatisfied about your body shape leads to psychosocial maladjustment because people absorb external negative feedback about their looks and develop greater self-loathing, which causes body dysmorphic disturbances [25, 26]. Self-esteem develops directly from body image recognition because people who view themselves positively perform healthier psychological activities and maintain better overall health results. When people view their bodies negatively, they experience higher rates of anxiety along with poor choices that affect their health [27]. Various research investigates how body image affects both individual self-concept and academic performance and physical activity of adolescents [21]. Body image has multiple effects on both life satisfaction and psychosocial compatibility dimensions for individual persons. Educational and health contexts must prioritize body

image promotion since it directly contributes to mental health improvement and promotes healthy behaviors while enhancing academic achievements [27, 28]. The results emphasize that interventions must be created for body image problems because they promote complete development and wellness.

Academic excellence, together with mental well-being development of young individuals, depends fundamentally on psychological and social compatibility. According to Cherches and Markovich [29] and Persiyantseva and Artemenkov [30] high-achieving students show advanced self-sufficiency and social competence and psychological security to excel academically. These mental qualities make students smarter while they build their emotional strength to deal with obstacles successfully. As it Academically struggling students who have attendance issues or perform poorly tend to show diminished psychological compatibility as compared to their peers. Academic performance suffers when students experience feelings of deprivation combined with reduced self-confidence because these factors block their academic aspirations [31]. And This evidence demonstrates the urgency of implementing programs to support student growth by addressing mental obstacles as well as developing their entire set of abilities. As the psychological traits of young people develop fundamentally through their family relationships as well as their personal resources and their network connections. Emotional stability develops through being part of supportive social networks as well as mastering effective ways to handle stress [30, 31]. Students who establish emotional stability benefit from better focus while handling pressure, which enables them to develop positive perspectives toward learning and personal growth. The development of inclusive educational programs serves a critical function because they address psychological barriers to help students from all backgrounds succeed.

The present study stresses the importance of creating training programs to develop mental toughness in university students because it directly leads to better physical self-image and psychological harmony. Studies show that higher education students face frequent mental health concerns and poorly maintained lifestyles strongly relate to the development of anxiety and depression symptoms [32]. Strength training programs created for individual needs improve both physical wellness and mental wellness by personalizing workout activities [33]. Additionally, comprehensive mental health promotion initiatives, like the ABC-uni intervention, highlight the importance of integrating mental well-being into university curricula, leading to supportive environments and improved mental health outcomes [34]. A methodological framework based on mental toughness development produces major benefits for student's psychological and social stability [35]. University students navigate through multiple scenarios while developing individual aspects within the general university environment. Young people cannot find stability and security because university life demands college students to display psychological characteristics for success and academic achievement, thus making psychological preparation essential for university practice. Universities must establish supportive training programs to develop mental toughness because they protect students from negative impacts of academic and social stressors [8, 36].

The study adds new scientific data through its development of training methods to enhance mental toughness, physical self-understanding, and psychological adjustment in university students. The present research investigates how mental toughness training affects the development of physical self-understanding along with psychological adjustment systems among university students. Researchers predict there will be statistically significant variations between pre- and post-tests taken from experimental and control group participants regarding mental toughness, physical self-concept, and psychological adjustment scores. The post-survey findings demonstrate statistically substantial between-group differences for comparable variables, whereas the experimental group outperforms due to the implemented training procedures. The research relies on an experimental approach to generate scientific evidence regarding mental toughness programs as an essential tool for improving both physical and mental university student capabilities for handling academic challenges while maximizing their psychological and social adaptation.

2. Materials and Methods

2.1. Study Participants

Undergraduate students from their second and third years at the College of Education participated in this study, amounting to 176 participants (98 females and 78 male) between the ages of 18 and 20 years. The sample size was calculated based on a population of 325 undergraduate students representing three majors within the college. Stephen K. Thompson's equation Thompson [37] allowed calculation of the correct sample size using 95% confidence ($Z = 1.96$) together with an error margin of 0.05 ($d = 0.05$) and an estimated proportion of variability ($p = 0.5$). A purposive non-probability sampling approach chose 176 participants for inclusion in the study at first. The final study group consisted of $n = 110$ participants, despite excluding the 66 individuals who failed to meet the inclusion requirements and withdrew from the study. A sample of 110 students was organized into experimental and control groups with equal numbers of 55 participants. The experimental group participated in mental toughness training while the control group received no intervention.

The study participants needed to provide consent while being enrolled as undergraduate students in the College of Education for inclusion. Participants were excluded from the study because either (1) their medical condition created obstacles for completing assessments, (2) they failed to carry out data instruments properly, or (3) they were absent from assessments when data was recorded. The project received approval from the Ethics Committee of King Faisal University (Ref. No. KFU-2024-8-JAN-ETHICS248514)) under the framework of the Declaration of Ndebele [38]. The research assistants with pre-training assisted individually for scale completion at university facilities to address any uncertainties that might arise. The scales were distributed to participants within academic year while being conducted in morning classroom sessions.

Steven K. Thompson's equation:

$$n = \frac{N \times p(1-p)}{\left[\left[N-1 \times \left(d^2 \div z^2\right)\right] + p(1-p)\right]}$$

n: sample size; N: population size =26; z: confidence level at 95% (1.96); d: Error proportion (0.05); p: proportion (50%)

Table 1.
Descriptive statistics.

	EG		CG	
	Mean	**Std.**	**Mean**	**Std.**
Age	18.245	0.501	18.271	0.48

2.2. Study Design

The College of Education students from King Faisal University in Saudi Arabia participated in an organized mental toughness training program during their intervention phase. All participants received pre-assessment measures, which were gathered between August 26 and 27 of the year 2024 for baseline measurement. This study included two groups: An experimental group that received mental toughness training for eight weeks through the program in Appendix A, while the control group participated in a traditional general program running for eight weeks without mental toughness training. The experimental training program ran from September 1 to October 17 of 2024 before extending across Sundays, Tuesdays, and Thursdays three times per week. Post-intervention measurements of both groups occurred on October 20 and 21, 2024, by implementing equivalent procedures that matched the pre-implementation assessment protocols. The study's participants learned about everything from goals to dangers along with ethical frameworks before the research began. All participants needed to authorize their participation by signing voluntary consent forms relating to their commitment to uphold the research guidelines. The research protocol secured both the participants' ethical rights and their well-being through minimal risks from the beginning to the end of the study.

2.3. Main Outcomes

2.3.1. Mental Toughness Scale

Researchers developed the Mental Toughness Scale by applying mental toughness ideas presented by Gucciardi, et al. [3]. The researchers directly developed thirty-four items to match the traits that Gucciardi, et al. [3] identified as a challenge (7 attributes), social confidence (6 attributes), confidence in one's abilities (6 attributes), emotional control (6 attributes), and commitment (7 attributes). Four university educators revised the statement content while dividing any confusing elements into items. The evaluation divided 14 more items from specific traits that Gucciardi, et al. [3] initially identified. The final result consists of 48 items that aim to assess the four dimensions proposed by Gucciardi, et al. [3]: challenge (9 attributes; "I always strive to push the limits of my abilities"), social confidence (10 attributes; "I speak confidently in front of a group of people"), self-confidence (9 attributes; "I trust my ability to learn and acquire new skills"), emotional control (10 attributes; "I deal with failures calmly without losing control"), and commitment (10 attributes; "I stay focused even after facing difficulties"). The survey used a five-point Likert scale from 1 = strongly disagree to 5 = strongly agree for participant responses. Seven items received reverse scoring to prevent specific response configurations (see Appendix A). This measure achieved good reliability ($\alpha = 0.88$).

2.3.2. Physical Self-Concept

The researcher utilized the Physical Self-concept Questionnaire (PSQ)Marsh [39] and Marsh, et al. [40] to establish students' physical self-concept. The positive wording structure and phrase format of items best suited students, so the questionnaire was designed in this manner in Appendix B. The survey used a five-point Likert scale from 1 = "does not apply to me strongly", 5 ="applies to me strongly." This measurement achieved good reliability ($\alpha = 0.82$).

2.3.3. Psychological Adaptation Scale

The Psychological Adaptation Scale (PAS) provides students with an assessment tool Biesecker, et al. [41] for adaptation. The PAS contains 24 items. The four domains focused on the PAS assessment measure (1) coping efficacy, (2) self-esteem, (3) spiritual/existential meaning, and (4) social integration. Each domain included 6 items (see Appendix C). The Likert-type rating system used a 5-point scale where participants selected between 1 = strongly does not apply, 2 = does not apply, 3 = somewhat applies, up to 4 = applies, and 5 = strongly applies. The measured reliability of the scale reached 0.78.

2.4. Experimental Procedures

The program rolled out through systematic implementation of mental toughness exercises over eight weeks. The experimental subjects spent 30–35 minutes in training sessions through 24 sessions that took place three times each week. The experimental group received mental toughness training that incorporated specific exercises to build capabilities in a challenge, social confidence, confidence in abilities, emotional control, and commitment. Combining theoretical content with practical work followed by reflective periods strengthened how participants applied their learned concepts. The standard curriculum choices of the control group served as the baseline for evaluating how mental toughness interventions

impacted the program. Standardized test conditions were implemented to achieve result validity and reliability in every measurement. The researchers used detailed timelines and methodological planning to evaluate mental toughness training effects on participant students. (see Appendix D).

2.5. Statistical Analysis

The study's results were statistically analyzed using IBM-SPSS 26 (Chicago, IL, USA) software. To emphasize the significance of the findings, several statistical measures were computed, including the mean, standard deviation, coefficient of variation, confidence interval with lower and upper bounds (95% CI), and effect size (ES). The differences in means between the experimental and control groups were determined through t-test analysis. For this study, statistical significance was established at a reference value of $p \leq 0.05$.

3. Results

The data in Figures 1 and 2 display the mean score evaluation from pre-study and post-study periods for experimental versus control groups alongside subsequent measurement variations showing better outcomes with the experimental group.

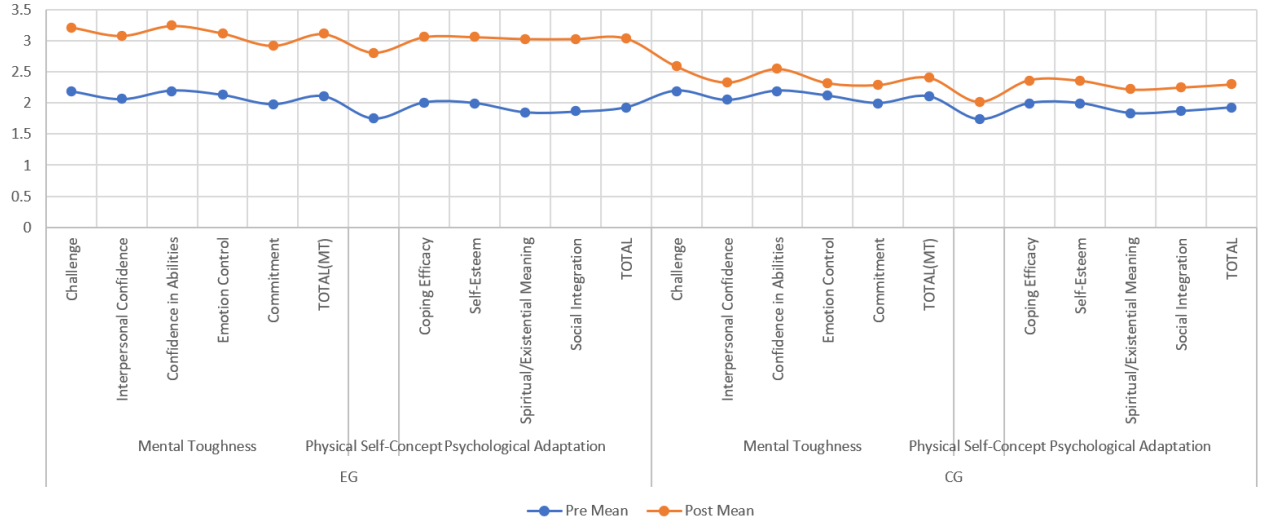

Figure 1.
Mean values during the pre-study and post-study phases for both the experimental and control groups.

Table 2.
Descriptive statistics of experimental and control groups.

Group	Outcome measures		Pre			Post			t	ES	Sig.
			Mean	Std.	Variance	Mean	Std.	Variance			
EG	Mental Toughness	**Challenge**	**2.19**	**0.21**	**0.04**	**3.22**	**0.19**	**0.04**	**22.15**	**0.96**	**<0.01**
		Interpersonal Confidence	2.06	0.22	0.05	3.08	0.21	0.04	16.22	0.90	<0.01
		Confidence in Abilities	2.20	0.20	0.04	3.24	0.20	0.04	16.87	0.96	<0.01
		Emotion Control	2.13	0.20	0.04	3.12	0.20	0.04	16.38	0.92	<0.01
		Commitment	1.98	0.18	0.03	2.92	0.19	0.03	17.04	0.95	<0.01
		TOTAL(MT)	2.11	0.09	0.01	3.11	0.09	0.01	36.27	0.99	<0.01
	Physical Self-Concept		1.75	0.19	0.04	2.81	0.13	0.02	19.42	0.95	<0.01
	Psychological Adaptation	Coping Efficacy	2.01	0.34	0.12	3.06	0.20	0.04	21.58	0.93	<0.01
		Self-Esteem	2.00	0.21	0.05	3.06	0.18	0.03	19.76	0.93	<0.01
		Spiritual/Existential Meaning	1.85	0.22	0.05	3.03	0.18	0.03	28.48	0.96	<0.01
		Social Integration	1.86	0.22	0.05	3.03	0.17	0.03	16.14	0.94	<0.01
		TOTAL	1.93	0.13	0.02	3.04	0.09	0.01	42.86	0.98	<0.01
CG	Mental Toughness	Challenge	2.20	0.21	0.04	2.59	0.15	0.02	22.15	0.90	<0.01
		Interpersonal Confidence	2.05	0.21	0.04	2.33	0.13	0.02	16.22	0.83	<0.01
		Confidence in Abilities	2.20	0.19	0.04	2.55	0.13	0.02	16.87	0.84	<0.01
		Emotion Control	2.12	0.19	0.04	2.32	0.15	0.02	16.38	0.83	<0.01
		Commitment	2.00	0.18	0.03	2.29	0.10	0.01	17.04	0.84	<0.01
		TOTAL(MT)	2.11	0.09	0.01	2.41	0.06	0.00	36.27	0.96	<0.01
	Physical Self-Concept		1.74	0.19	0.03	2.02	0.14	0.02	19.42	0.87	<0.01
	Psychological Adaptation	Coping Efficacy	2.00	0.32	0.10	2.37	0.26	0.07	21.58	0.90	<0.01
		Self-Esteem	2.00	0.21	0.04	2.36	0.12	0.01	19.76	0.88	<0.01
		Spiritual/Existential Meaning	1.84	0.22	0.05	2.22	0.17	0.03	28.48	0.94	<0.01
		Social Integration	1.87	0.22	0.05	2.25	0.17	0.03	16.14	0.83	<0.01
		TOTAL	1.93	0.13	0.02	2.30	0.11	0.01	42.86	0.97	<0.01

Note: EG—Experimental Group; CG—Control Group; ES— Effect size.

Table 2 shows that the experimental group (EG) achieved important gains in all measured dimensions above the control group (CG) results, which confirms that mental toughness training was effective. The participants in the experimental group showed significant increases in their mean scores across six dimensions, which corresponded to challenge and interpersonal confidence as well as confidence in abilities and emotions, control, and commitment; effect sizes measured at 0.90 to 0.99 demonstrated a robust intervention outcome. The experimental group participants achieved a large improvement in their total mental toughness (MT) score from 2.11 to 3.11, whereas the control group participants only increased slightly from 2.11 to 2.41, thus demonstrating the effectiveness of this program. The participants in the experimental group showed substantially higher improvements in physical self-concept measurements than the control group participants. The experimental group participants started with a score of 1.75 and finished with 2.81, while the control group participants moved from 1.74 to 2.02. The implementation of structured mental toughness exercises produced greater enhancement of psychological adaptation scores together with their sub-dimensions across the experimental group compared to the control group. The research data demonstrates that organized mental toughness training methods produce substantial improvements in the mental and physical toughness levels of participants. Meaningful progress occurred in the experimental group according to the results of statistical analyses, which yielded significant differences ($p < 0.01$) between pre- and post-measurement points. Educational interventions targeted to sports students prove essential for sustainable development since the comparison group recorded minimal changes throughout the study period. Such research findings demonstrate that adding mental toughness training to curriculums helps students develop comprehensive individual advancement.

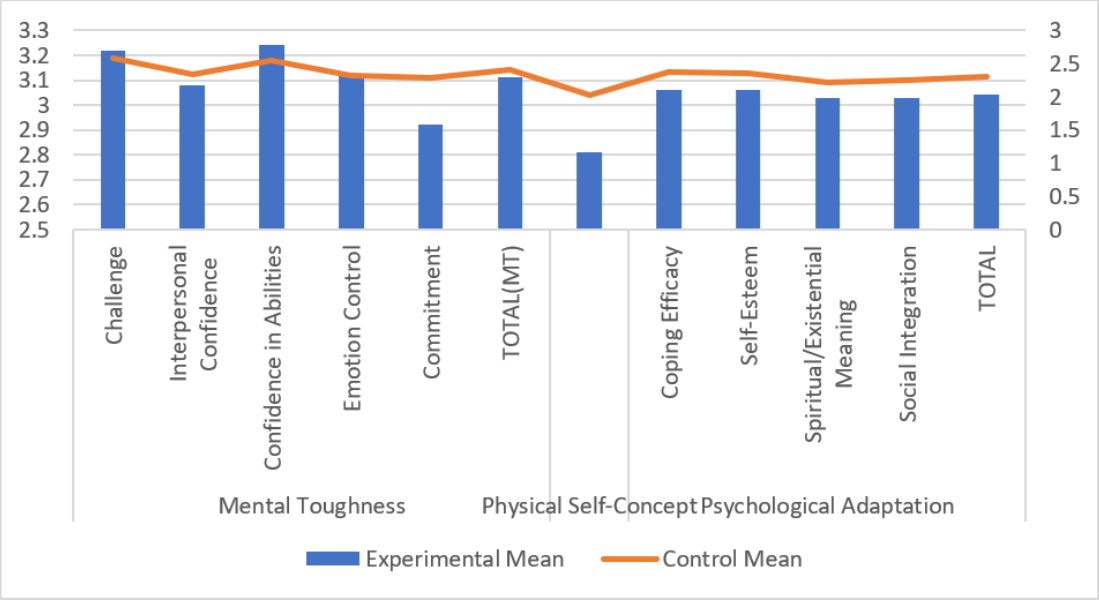

Figure 2.
The experimental group demonstrates dissimilarities in comparison to the control group regarding the measured metrics.

Table 3.
Mean, standard deviation, and ES in post-test measurements of experimental and control groups.

Scales	Outcome measures	Experimental		Control		t	ES	CI		P
		Mean	Std. Deviation	Mean	Std. Deviation			Lower	Upper	
Mental Toughness	Challenge	3.22	0.19	2.59	0.15	19.70	0.78	0.572	0.700	<0.01
	Interpersonal Confidence	3.08	0.21	2.33	0.13	23.16	0.83	0.688	0.817	<0.01
	Confidence in Abilities	3.24	0.20	2.55	0.13	22.05	0.82	0.629	0.753	<0.01
	Emotion Control	3.12	0.20	2.32	0.15	23.31	0.83	0.725	0.860	<0.01
	Commitment	2.92	0.19	2.29	0.10	22.60	0.83	0.582	0.694	<0.01
	TOTAL(MT)	3.11	0.09	2.41	0.06	49.45	0.96	0.676	0.732	<0.01
Physical Self-Concept		2.81	0.13	2.02	0.14	30.55	0.95	0.734	0.836	<0.01
Psychological Adaptation	Coping Efficacy	3.06	0.20	2.37	0.26	15.42	0.69	0.599	0.776	<0.01
	Self-Esteem	3.06	0.18	2.36	0.12	23.64	0.84	0.639	0.755	<0.01
	Spiritual/Existential Meaning	3.03	0.18	2.22	0.17	24.02	0.84	0.742	0.876	<0.01
	Social Integration	3.03	0.17	2.25	0.17	24.29	0.85	0.724	0.852	<0.01
	TOTAL	3.04	0.09	2.30	0.11	39.40	0.93	0.708	0.783	<0.01

The data in Table 3 shows that the experimental participants met significant advancement compared to control group members in their mental toughness abilities and their physical self-concept and psychological adaptation scores. The participants in the experimental group experienced substantial mean score growth in challenge (2.59 to 3.22), interpersonal confidence (2.33 to 3.08), confidence in abilities (2.55 to 3.24), emotion control (2.32 to 3.12), and commitment (2.29 to 2.92) while effect sizes (ES) maintained values between 0.78 and 0.96, demonstrating an intense intervention impact. The program delivered significant enhancements to both mental toughness score total (2.41 to 3.11) and physical self-concept (2.02 to 2.81), which can be attributed to their large effect sizes (ES) of 0.95. The psychological outcomes of coping efficacy, self-esteem, spiritual/existential meaning, and social integration demonstrated substantial improvements in the experimental group according to mean difference along with effect sizes (ES) between 0.69 and 0.85. Evidence derived from this study demonstrates that students who received mental toughness training demonstrated improved psychological and physical health, but the control group maintained only small variations, which emphasizes the need for specialized intervention approaches. Results with $p < 0.01$ show the reliability and validity of the observed effects in this study.

4. Discussion

The information within Tables 2 and 3 demonstrates an in-depth evaluation of both experimental and control group pre-study and post-study measurements alongside their post-study differences, which favor the experimental group. Every psychological dimension showed substantial growth in mean scores between pretest and posttest evaluations for each assessed area such as challenge, personal confidence, confidence in abilities, emotional control, and commitment. The research findings show that the mental toughness training program generated productive results for developing these psychological characteristics. Research findings show increased mean scores between two participating groups for mental toughness development as well as physical self-concept and psychological adaptation among study participants. The program's effectiveness becomes evident through strong practical effect sizes (ES) ranging from 0.69 to 0.98, with $p < 0.01$ indicating statistical significance in the obtained results. The program demonstrated its effectiveness in enhancing mental toughness, physical self-perception, and psychological adaptation according to results that showed significant differences between experimental and control group participants. According to Guzmán-Muzante, et al. [7] psychologically tough people demonstrate social connection and self-control abilities together with high self-confidence to help them handle stressful situations more efficiently. The study conducted by Greinert, et al. [42] and Hutomo [43] identifies three fundamental characteristics of MT, which comprise resilience together with focus alongside motivation for sporting success. High MT levels, according to Hudaniah and Nabila Masturah [44]; Dorling and Bahr [45] and Zhao, et al. [46] have been proven to decrease competition anxiety in athletes, which improves their performance. According to McLoughlin, et al. [47] the perception of stress as a challenge instead of a threat leads to better mental health together with enhanced well-being because of a positive stress mindset.

The study conducted by Gil-Hernández [48] demonstrates that self-confidence helps participants resist high perfectionism levels and anxiety, thus improving their total performance results. Studies by Ponomaryov, et al. [49] and Hidayat, et al. [50] proved that mental toughness serves as a fundamental factor that helps participants stay competitive when facing obstacles and pressure situations. According to Hidayat, et al. [50] psychological techniques, including self-talk and mental imagery, led to improvements in motor skills development while boosting self-confidence. The observed results demonstrate the need for psychological training implementation because participants in the experimental group outperformed their counterparts from the control group.

Farzad and Karami [36] conducted research that showed participants who received mental toughness interventions achieved major progress with their goal-setting abilities, thus demonstrating how the program supports vital mental skills for academic achievement. The Siswa Tangguh Training program, according to Julianty, et al. [12] led students to increase their mental toughness levels by 60.5%. Proof regarding the effectiveness of individualized mental toughness training came from Pocius and Malinauskas [51] when they demonstrated how the program enhanced numerous psychological traits such as emotional regulation abilities and personal confidence. The research conducted by Dahiya and Kumar [52] and Julvanichpong, et al. [53] demonstrates that strategic skills training enhances mental strength and preparedness within different student groups. Data from this study proves the identified trends by demonstrating improved mental toughness abilities in challenge alongside interpersonal confidence and confidence in abilities and emotional control and commitment within participants of the experimental group compared to those in the control group. Research findings indicate that formal mental toughness training establishes itself as an effective educational strategy to build complete psychological abilities that let students control stress better while focusing better and obtaining better academic results with extracurricular success.

The results of the current study align with existing research, indicating that structured mental toughness programs play a pivotal role in enhancing psychological compatibility among students. For instance, Julianty, et al. [12] demonstrated a significant 60.5% improvement in mental toughness following the Siswa Tangguh Training program, underscoring its importance for academic success and psychological well-being. Similarly, Andreeva, et al. [54] reported that a mental fitness program for female students effectively reduced stress-related conditions, leading to improved mood and overall well-being. Interventions aimed at developing mental toughness have also yielded promising outcomes. Pocius and Malinauskas [51] highlighted substantial improvements in self-confidence and emotional control among basketball athletes, emphasizing the program's potential to foster resilience in high-pressure environments. These findings are further supported by studies such as those conducted by Lee, et al. [55] and Sofyan and Nurjaya [56] which suggest that mental toughness training not only enhances self-confidence but also mitigates negative emotional experiences, thereby improving cognitive performance and adaptability in challenging university settings. Overall, the integration of mental toughness programs into

educational frameworks appears to be a critical strategy for cultivating resilience, promoting emotional regulation, and enhancing students' psychological compatibility. The observed improvements in both psychological and physical dimensions highlight the necessity of adopting comprehensive, targeted interventions to support holistic student development. This study's findings reinforce the importance of mental toughness as a foundational skill for navigating the demands of modern education and achieving long-term success.

5. Conclusions

This research generates important findings about how structured mental toughness training programs boost the psychological and physical competencies of students. All dimensions of mental toughness showed substantial improvements after participants joined the training program, according to evaluation findings, including challenge and interpersonal confidence, emotional control, confidence in abilities, and commitment. The research data showed statistical significance ($p < 0.01$) between pre-test and post-test measurement periods. Members of the experimental group showed significant advancements in their physical self-perception. Results indicate that mental toughness education creates both improved psychological traits and more positive physical perceptions in participants. Better psychological adaptation became evident from the participants' increased coping efficacy together with elevated self-esteem and strengthened spiritual/existential meaning along with improved social integration. Outcomes of mental toughness education would benefit from integration, which provides new capabilities to measure participant developments and reinforce studied material.

5.1. Future Research

In order to advance this field of research, it is recommended that future studies examine how mental toughness programs affect various populations characterized by different age levels, educational backgrounds, and professional athletic involvement. Researchers should direct their studies to assess how these programs impact long-term psychological adjustment and physical self-concept through the development of enhanced mental training systems based on advanced digital technologies like artificial intelligence and virtual reality. Researchers must examine program implementation strategies across various educational and sports environments, which include schools and regional sports clubs, to establish contextual effectiveness. A thorough understanding of the correlation between mental toughness and long-term academic success among university students requires exploring various contexts by examining practical implementation challenges and suggesting solutions for different educational institutions.

5.2. Implications for Educational Institutions

The research findings demonstrate that educational institutions, specifically including King Faisal University, must implement mental toughness training to develop student resilience. Educational institutions must implement these programs through curricular and extracurricular channels to help students learn challenge management and emotional control skills along with commitment for maximizing their academic development. Systematically developed programs that improve students' interpersonal confidence and self-esteem allow them to transition better into new social environments and adapt mentally to their surroundings. Organizations that make mental toughness a priority enable educational environments for complete development while providing their students with vital stress-management resources for success in demanding university contexts. The identified strategy enhances personal achievement while matching educational targets dedicated to sustaining environmental health across educational campuses. These findings underline the need to implement whole-scale mental health programs that will make students ready for upcoming hurdles and future career demands in complex settings. Such programs need continuous assessment and program improvements to deliver their best effects on student success.

References

[1] S. G. Saleh and R. M. AlAli, "Psychological and cultural preparation of university students to face the challenges of globalization in alignment with the sustainable development goals (sdgs): A field study," *Journal of Lifestyle and SDGs Review*, vol. 5, no. 1, p. e02782, 2025. https://doi.org/10.47172/2965-730X.SDGsReview.v5.n01.pe02782

[2] L. Crust and P. J. Clough, "Developing mental toughness: From research to practice," *Journal of Sport Psychology in Action*, vol. 2, no. 1, pp. 21-32, 2011. https://doi.org/10.1080/21520704.2011.563436

[3] D. F. Gucciardi, B. Jackson, S. Hanton, and M. Reid, "Motivational correlates of mentally tough behaviours in tennis," *Journal of Science and Medicine in Sport*, vol. 18, no. 1, pp. 67-71, 2015. https://doi.org/10.1016/j.jsams.2013.11.009

[4] H. St Clair-Thompson, R. Giles, S. P. McGeown, D. Putwain, P. Clough, and J. Perry, "Mental toughness and transitions to high school and to undergraduate study," *Educational Psychology*, vol. 37, no. 7, pp. 792-809, 2017. https://doi.org/10.1080/01443410.2016.1184746

[5] E. K. Mireku, E. Kissi, E. Badu, C. O. Aigbavboa, T. Kwofie, and K. Eluerkeh, "Establishing the characteristics of mental toughness among construction professionals," *Engineering, Construction and Architectural Management*, 2024. https://doi.org/10.1108/ECAM-07-2023-0751

[6] R. S. Aditya *et al.*, "Mental toughness may have an impact on athlete's performance: Systematic review," *Retos: Nuevas tendencias en Educación Física, Deporte y Recreación*, vol. 56, pp. 328-337, 2024. https://doi.org/10.47197/retos.v56.103768

[7] J. P. Guzmán-Muzante, G. A. R. Ortíz, Á. Urrea-Cuéllar, A. E. R. Carrasco, and A. M. Fonseca, "Mental toughness: State or trait? Context and sporting performance in rugby union, a longitudinal study," *Retos*, vol. 61, pp. 988-995, 2024. https://doi.org/10.47197/retos.v61.108958

[8] A. Akbar *et al.*, "Understanding mental toughness in student-athletes: Insights from sport psychology," *Retos: Nuevas tendencias en educación física, deporte y recreación*, vol. 54, pp. 1-9, 2024. https://doi.org/10.47197/retos.v54.102230

[9] L. Hardy, J. Bell, and S. Beattie, "A neuropsychological model of mentally tough behavior," *Journal of Personality*, vol. 82, no. 1, pp. 69-81, 2014. https://doi.org/10.1111/jopy.12034

[10] D. F. Gucciardi, S. Gordon, and J. A. Dimmock, "Towards an understanding of mental toughness in Australian football," *Journal of Applied Sport Psychology*, vol. 20, no. 3, pp. 261-281, 2008. https://doi.org/10.1080/10413200801998556

[11] D. Jang, D. Lee, and H. Jeon, "Grounded theory approach to the development of mental toughness: Exploring the soccer player–coach interactions and their perception," *Korean Journal of Sport Science*, vol. 33, no. 2, pp. 188-202, 2022. https://doi.org/10.24985/kjss.2022.33.2.188

[12] S. I. Julianty, D. Y. Mukhtar, and S. Supriyanti, "Boosting student mental: the impact of Siswa tangguh training on student mental toughness," *Psikostudia: Jurnal Psikologi*, vol. 13, no. 3, pp. 329-338, 2024. https://doi.org/10.30872/psikostudia.v13i3.14913

[13] S. Kumbar and B. M. Patil, "A study on Investigating the levels of mental toughness and resilience among athletes, and how these psychological traits contribute to their performance in competitive sports," *International Journal of Research Publication and Reviews*, 2024. https://doi.org/10.55248/gengpi.5.0424.0914

[14] Y. Ojio, K. Yamada, R. Amemiya, S. Kawamura, S. Rice, and R. Purcell, "Understanding the relationship between sport-related psychological safety and mental toughness in male elite athletes," 2024. https://doi.org/10.21203/rs.3.rs-5315778/v1

[15] J. Loher, "Leadership: Full engagement for success in the sport in murfy edition." Champaign, IL: Human Kinetics, 2015, pp. 155-170.

[16] J. Golby and P. Wood, "The effects of psychological skills training on mental toughness and psychological well-being of student-athletes," *Psychology*, vol. 7, no. 06, p. 901, 2016. https://doi.org/10.4236/psych.2016.76092

[17] J. Mutz, P. Clough, and K. A. Papageorgiou, "Do individual differences in emotion regulation mediate the relationship between mental toughness and symptoms of depression?," *Journal of Individual Differences*, vol. 38, no. 2, pp. 71-82, 2017. https://doi.org/10.1027/1614-0001/a000224

[18] B. O. Miçoogullari and R. Ekmekçi, "Evaluation of a psychological skill training program on mental toughness and psychological wellbeing for professional soccer players," *Universal Journal of Educational Research*, vol. 5, no. 12, pp. 2312-2319, 2017. https://doi.org/10.13189/ujer.2017.051222

[19] A. O. Gosteva, "The physical self perception characteristics in girls studying at a university," *Innovacionnaâ Nauka: Psihologiâ, Pedagogika, Defektologiâ*, vol. 6, no. 4, pp. 89–98, 2023. https://doi.org/10.23947/2658-7165-2023-6-4-89-98

[20] R. I. Kartikasari, R. S. Primindari, D. Nurafifah, A. T. Kusumaningrum, and I. Mauliyah, "The self-concept of adolescent girls regarding physical changes during puberty," *SURYA: Jurnal Media Komunikasi Ilmu Kesehatan*, vol. 15, no. 3, pp. 114-122, 2023. https://doi.org/10.38040/js.v15i3.846

[21] J. F. N. Guilherme, C. A. R. de Sena Martins, M. C. d. O. S. Nunes, and S. N. de Jesus, "Physical condition,(dis) satisfaction with body self-image and academic performance in adolescence," *Revista Contemporânea*, vol. 4, no. 6, p. e4656, 2024. https://doi.org/10.56083/RCV4N6-064

[22] M. A. Ferro, M. Dol, K. A. Patte, S. T. Leatherdale, and L. Shanahan, "Self-concept in adolescents with physical-mental comorbidity," *Journal of Multimorbidity and Comorbidity*, vol. 13, p. 26335656231211475, 2023. https://doi.org/10.1177/26335656231211475

[23] G. Chernyakova, O. Avdiyevska, and G. Danylenko, "Assessment of physical development of adolescents using body mass index and body self-perception," *Медичні перспективи= Medicni perspektivi (Medical perspectives)*, vol. 2, pp. 133-142, 2024. https://doi.org/10.26641/2307-0404.2024.2.307607

[24] C. Galán-Arroyo, M. A. B. Da Silva, and J. Rojo-Ramos, "Self-concept in physical education to improve school health post-pandemic," *Revista Electrónica Interuniversitaria de Formación del Profesorado*, vol. 27, no. 2, pp. 123-137, 2024.

[25] N. Choudhary and R. Chaturvedi, "Impact of eating attitude on self-criticism and body dysmorphic concern among university students," *Educational Administration: Theory and Practice*, vol. 30, no. 4, pp. 8597–8608, 2024. https://doi.org/10.53555/kuey.v30i4.2791

[26] P. Nongmaithem and N. Devi, "Body image and self-esteem among young adults," *Futuristic Trends in Social Sciences*, vol. 3, pp. 177-184, 2024. https://doi.org/10.58532/v3bbso3p3ch1

[27] J. Jiménez-Morcillo, D. J. Ramos-Campo, S. Rodríguez-Besteiro, and V. J. Clemente-Suárez, "The association of body image perceptions with behavioral and health outcomes among young adults," *Nutrients*, vol. 16, no. 9, p. 1281, 2024. https://doi.org/10.3390/nu16091281

[28] M. Babchuk, "Peculiarities of body image influence on the quality of life in individuals with high and low levels of physical," vol. 2, pp. 18–24, 2024. https://doi.org/10.32782/3041-2005/2024-2-3

[29] T. E. Cherches and V. A. Markovich, "Socio-psychological factors of harmonicity of the individual students," pp. 253–256, 2024. https://doi.org/10.55000/ipsf.2024.55.12.049

[30] S. V. Persiyantseva and S. L. Artemenkov, "Study of the relationship between personal resource and psychological well-being of students at the initial stage of study at a university," *Modeling and Data Analysis*, vol. 13, no. 4, pp. 23–44, 2023. https://doi.org/10.17759/mda.2023130402

[31] A. Akkozhoeva and B. Adilbek uulu, "Psychosocial dynamics and mental well-being of modern youth," *Bulletin of Science and Practice*, vol. 10, no. 5, pp. 673-677, 2024. https://doi.org/10.33619/2414-2948/102/92

[32] F. Caamaño-Navarrete *et al.*, "Unhealthy lifestyle contributes to negative mental health and poor quality of life in young university students," in *Healthcare*, 2024, vol. 12, no. 22, p. 2213.

[33] Z. Jin and H. M. ALI, "A discussion related to the impact of incorporating standardised individualised strength training in the physical education curriculum of colleges and universities on the mental health of college students," *Journal of Education and Educational Research*, vol. 10, no. 3, pp. 91-94, 2024. https://doi.org/10.54097/q5eexf73

[34] L. Nielsen *et al.*, "The ABCs of mental health at the university: A multi-level intervention design for promoting mental well-being," *Frontiers in Public Health*, vol. 12, p. 1382393, 2024. https://doi.org/10.3389/fpubh.2024.1382393

[35] G. Caldarelli, B. Pizzini, M. Cosenza, and A. Troncone, "The prevalence of mental health conditions and effectiveness of psychological interventions among university students in Italy: A systematic literature review," *Psychiatry Research*, vol. 342, p. 116208, 2024. https://doi.org/10.1016/j.psychres.2024.116208

[36] V. Farzad and A. Karami, "Impact of a mental toughness intervention on goal-setting in university students: A randomized controlled study," *Deleted Journal*, vol. 2, no. 1, pp. 58–64, 2024. https://doi.org/10.61838/kman.psychnexus.1.2.10

[37] S. k. Thompson, "Sampling third edition." Hoboken, New Jersey, Canada: John Wiley & Sons, 2012, pp. 59-60.
[38] P. Ndebele, "The declaration of helsinki, 50 years later," *Jama*, vol. 310, no. 20, pp. 2145-2146, 2013.
[39] H. W. Marsh, *The self-description questionnaire I: Sdq i manual*. Macarthur, NSW: University of Western Sydney, 1990.
[40] H. W. Marsh, A. Papaioannou, and Y. Theodorakis, "Causal ordering of physical self-concept and exercise behavior: Reciprocal effects model and the influence of physical education teachers," *Health Psychology*, vol. 25, no. 3, p. 316, 2006. https://doi.org/10.1037/0278-6133.25.3.316
[41] B. B. Biesecker *et al.*, "Development and validation of the Psychological Adaptation Scale (PAS): use in six studies of adaptation to a health condition or risk," *Patient Education and Counseling*, vol. 93, no. 2, pp. 248-254, 2013.
[42] A. Greinert, C. Schöne, M. Wilhelms, and J. Stiensmeier-Pelster, "The mental toughness scales (MTS)," *European Journal of Psychological Assessment*, pp. 1-24, 2024. https://doi.org/10.1027/1015-5759/a000875
[43] A. Hutomo, "Analysis of self-efficacy and mental toughness on peak performance in u-16 football athletes of Koni, Bekasi city," *Jurnal Indonesia Sosial Sains*, vol. 6, no. 1, pp. 44–53, 2025. https://doi.org/10.59141/jiss.v6i1.1566
[44] H. Hudaniah and A. Nabila Masturah, "Ketangguhan mental sebagai solusi kecemasan bertanding atlet," *Jurnal Psikologi*, vol. 20, no. 2, pp. 157-165, 2024. https://doi.org/10.24014/jp.v20i2.23019
[45] J. Dorling and M. Bahr, "Mental toughness in sports people," Center for Open Science. https://doi.org/10.31219/osf.io/9bhnu, 2024.
[46] S. Zhao, P. Chen, L. Jin, C. Yu, H. Zhang, and D. Lin, "Unlocking emotional well-being: Evaluation of a stress mindset intervention with a metacognitive approach," *Emotion*, pp. 1-6, 2025. https://doi.org/10.1037/emo0001474
[47] E. McLoughlin, R. Arnold, and L. J. Moore, "The tendency to appraise stressful situations as more of a threat is associated with poorer health and well-being," *Stress and Health*, vol. 40, no. 3, p. e3358, 2024. https://doi.org/10.1002/smi.3358
[48] Á. Gil-Hernández, "Tratado de nutrición (4," *Nutrición Hospitalaria*, vol. 41, no. 6, pp. 1324-1325, 2024.
[49] V. Ponomaryov, M. Korchagin, and Y. Kostenko, "Improvements in training settings and recommendations for the formation of a winner's mindset in the training process of wrestlers," *Naukovij Časopis Nacìonal'nogo Pedagogìčnogo Unìversitetu Ìmenì M.P. Dragomanova*, vol. 7, no. 180, pp. 137–142, 2024. https://doi.org/10.31392/udu-nc.series15.2024.7(180).28
[50] Y. Hidayat, Y. Yudiana, B. Hambali, K. Sultoni, U. D. Ustun, and C. Singnoy, "The effect of the combined self-talk and mental imagery program on the badminton motor skills and self-confidence of youth beginner student-athletes," *BMC Psychology*, vol. 11, no. 1, p. 35, 2023. https://doi.org/10.1186/s40359-023-01073-x
[51] E. Pocius and R. Malinauskas, "Development of mental toughness among basketball sports school students," *Behavioral Sciences*, vol. 14, no. 4, p. 314, 2024. https://doi.org/10.3390/bs14040314
[52] S. Dahiya and D. Kumar, "A comparative analysis of mental toughness in different level sportsmen," *International Journal of Physical Education, Sports and Health*, vol. 10, no. 6, pp. 321–323, 2023. https://doi.org/10.22271/kheljournal.2023.v10.i6e.3178
[53] T. Julvanichpong, C. Pattanamontri, S. Charoenwattana, and C. Singnoy, "The effect of a psychological skill training package on the mental readiness of taekwondo athletes," *Psychology*, vol. 13, no. 12, pp. 1670-1684, 2022. https://doi.org/10.4236/psych.2022.1312104
[54] O. Andreeva, N. Byshevets, B. A. Kashuba, L. Pasichniak, and Y. Lazakovych, "Application of mental fitness tools in the prevention of stress-associated conditions of female students of higher education establishments," *Physical Rehabilitation and Recreational Health Technologies*, vol. 3, no. 9, pp. 98–112, 2024. https://doi.org/10.15391/prrht.2024-9(3).01
[55] E. B. Lee *et al.*, "Performance-based acceptance and commitment training in a collegiate flight program," *Journal of Contextual Behavioral Science*, vol. 33, p. 100795, 2024. https://doi.org/10.1016/j.jcbs.2024.100795
[56] W. R. Sofyan and D. R. Nurjaya, "The relationship between mental toughness and competitive anxiety of diving athletes in the training phase," *Journal of Physical Education Health and Sport*, vol. 11, no. 2, pp. 54-59, 2024. https://doi.org/10.15294/jpehs.v11i2.16655

Appendix A.
S1. Mental Flexibility Scale

No.	Phrase	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	Adaptability to Change					
1.	I can easily adjust my plans when unexpected changes occur.					
2.	I am comfortable with changing my routine when necessary.					
3.	I find it easy to adapt to new environments or situations.					
4.	I can quickly shift my focus when priorities change.					
5.	I am open to trying new approaches to solve problems.					
6.	I handle unexpected challenges without feeling overwhelmed.					
7.	I am willing to revise my goals when circumstances change.					
	Cognitive Flexibility					
8.	I can see multiple solutions to a problem.					
9.	I am able to think creatively when faced with obstacles.					

No.	Phrase	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
10.	I can easily switch between different tasks or activities.					
11.	I enjoy exploring new ideas and perspectives.					
12.	I can adapt my thinking to fit new information.					
	Emotional Regulation					
13.	I can manage my emotions effectively in stressful situations.					
14.	I remain calm and composed when things don't go as planned.					
15.	I can quickly recover from emotional setbacks.					
16.	I am able to stay positive even in difficult circumstances.					
17.	I can adjust my emotional responses based on the situation.					

S2. Continue

No.	Phrase	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	Open-Mindedness					
18.	I am open to feedback and constructive criticism.					
19.	I enjoy learning from people with different viewpoints.					
20.	I am willing to reconsider my opinions when presented with new evidence.					
21.	I value diverse perspectives and ideas.					
22.	I am curious about exploring unfamiliar topics or concepts.					
	Problem-Solving Flexibility					
23.	I can approach problems from multiple angles.					
24.	I am comfortable with ambiguity and uncertainty when solving problems.					
25.	I can adapt my problem-solving strategies based on the situation.					
26.	I am willing to take risks to find innovative solutions.					
27.	I can break down complex problems into manageable parts.					
28.	I am persistent in finding solutions, even when faced with setbacks.					
29.	I can balance short-term and long-term goals when solving problems.					
30.	I am confident in my ability to handle unexpected challenges.					

Appendix B.

Physical Self-Concept.

No.	Phrase	strongly does not apply	Does not apply	Somewhat applies	Applies	Strongly Applies
1.	I am satisfied with my overall body shape and its proportions.					
2.	I perceive myself as physically healthy based on my appearance.					
3.	My physical appearance aligns with and reflects my capabilities.					
4.	Compared to my peers, I consider myself to possess a good level of physical fitness.					
5.	I have no difficulty performing routine daily tasks due to my physical capacity.					
6.	Lifting heavy objects poses no significant challenge for me.					

No.	Phrase	strongly does not apply	Does not apply	Somewhat applies	Applies	Strongly Applies
7.	I view myself as possessing above-average physical strength.					
8.	I am confident in my ability to overcome challenges that demand physical exertion.					
9.	My physical strength plays a crucial role in facilitating goal achievement.					
10.	With consistent effort, I believe I can enhance my physical strength.					
11.	Engaging in prolonged exercise does not easily fatigue me.					
12.	I classify myself as an individual with a high level of physical fitness.					
13.	I possess confidence in enduring demanding physical activities without compromise.					
14.	I firmly believe in the continuous improvement of my physical condition through dedication.					
15.	Over time, I observe measurable progress in my physical performance.					
16.	I experience contentment with both my weight and body composition.					
17.	My physical fitness enhances my perception of attractiveness.					
18.	I feel empowered to wear clothing that expresses my self-assuredness.					
19.	My physical appearance serves as a tangible representation of my self-esteem.					
20.	Confidence in my physical appearance contributes positively to my self-perception.					
21.	Executing complex movements comes naturally and effortlessly to me.					
22.	I excel in activities requiring fine motor precision and coordination.					
23.	I trust in my ability to acquire new motor skills rapidly and effectively.					
24.	I consistently perform at my highest potential in activities reliant on motor skills.					

Appendix C.
Psychological Adaptation scale.

No.	Phrase	Does not apply to me strongly	Does not apply to me	applies to somewhat	Applies to me	Applies to me strongly
	Axis One: Coping Efficacy					
1.	I possess the confidence to manage the daily stresses of life effectively.					
2.	In the face of challenges, I consistently identify and implement solutions to overcome them.					
3.	I am equipped with the necessary skills to address both personal and social issues.					
4.	Even under extreme pressure, I maintain composure and emotional balance.					
5.	When confronted with frustration, I actively work to reframe my perspective positively.					
6.	I trust in my capacity to make sound decisions when unexpected obstacles arise.					
	Axis Two: Self-Esteem					

No.	Phrase	Does not apply to me strongly	Does not apply to me	applies to somewhat	Applies to me	Applies to me strongly
7.	I take pride in being a self-assured and integrated individual.					
8.	I firmly believe that I deserve success and acknowledgment as much as others do.					
9.	With dedication and effort, I am confident in my ability to achieve my objectives.					
10.	Regardless of external achievements, I perceive myself as a person of inherent worth.					
11.	I recognize and celebrate my strengths and talents, prioritizing them in my pursuits.					
12.	I embrace the belief that I can progressively enhance and refine my abilities over time.					
	Third Axis: Spiritual/Existential Meaning					
13.	My life carries a profound significance that transcends materialistic dimensions.					
14.	I consistently seek sources of positivity and optimism within my everyday experiences.					
15.	Engaging in activities of spiritual or intellectual depth provides me with psychological solace.					
16.	I hold the conviction that there is a unique purpose or message intended for me in this existence.					
17.	I strive to comprehend the world around me more deeply, deriving meaningful lessons from it.					
18.	Despite challenging circumstances, I can attain inner peace and tranquility.					
	Axis Four: Social Integration					
19.	I experience a strong sense of belonging to a supportive community that embraces me fully.					
20.	I engage in meaningful interactions with others, fostering healthy and productive relationships.					
21.	Active participation in social activities enhances my feelings of inclusion and connection.					
22.	Communicating openly and sharing my emotions with others comes naturally to me.					
23.	The support from friends and family plays a pivotal role in improving my psychological well-being.					
24.	I actively contribute to uplifting others and aiding them in overcoming social adversities.					

Appendix D.
S1. Training program content

Week	Axis	Time (minutes)	Content of Sessions
1	Introduction to Mental Flexibility	30, 25, 30	Definition, core components, and initial exercises.
2	Cognitive Adaptability	25, 30, 30	Reframing thoughts, creative problem-solving.
3	Emotional Regulation	25, 30, 30	Managing emotions, staying calm under pressure.
4	Problem-Solving Skills	25, 30, 30	Developing and applying problem-solving strategies.
5	Creativity Enhancement	25, 30, 30	Fostering creativity in daily tasks and challenges.
6	Openness to New Experiences	25, 30, 30	Embracing uncertainty and diverse perspectives.
7	Integrating Mental Flexibility Components	25, 30, 30	Combining all dimensions in practical exercises.

Mental Flexibility Training Program for Students

Week 1: Introduction to Mental Flexibility

- Session 1 (30 minutes):
  - Content: Define mental flexibility and its importance in adapting to change, solving problems, and overcoming challenges. Discuss real-life examples of individuals who demonstrated mental flexibility in their success stories.
  - Exercise: Write down three recent situations where you had to adapt to change. Analyze how mental flexibility could have improved your response.
- Session 2 (25 minutes):
  - Content: Explain the core components of mental flexibility: cognitive adaptability, emotional regulation, problem-solving, creativity, and openness to new experiences.
  - Exercise: Choose a familiar task and brainstorm three alternative ways to complete it. Practice one of these alternatives.
- Session 3 (30 minutes):
  - Content: Initial exercises to promote positive thinking and cognitive adaptability.
  - Exercise: Write a list of fixed beliefs you hold about yourself or others. Challenge each belief by finding an exception or counterexample.

Week 2: Cognitive Adaptability

- Session 4 (25 minutes):
  - Content: Understand the importance of adapting thoughts and strategies to new information or changing circumstances.
  - Exercise: Solve a simple puzzle using two different approaches. Reflect on which approach worked better.
- Session 5 (30 minutes):
  - Content: Strategies for reframing negative thoughts into positive ones.
  - Exercise: Identify a past stressful situation and reframe it positively. Share your reflection with a partner.
- Session 6 (30 minutes):
  - Content: Practical exercise to enhance cognitive adaptability through creative problem-solving.
  - Exercise: Work in pairs to solve a hypothetical problem with limited resources. Focus on generating multiple solutions.

Week 3: Emotional Regulation

- Session 7 (25 minutes):
  - Content: Learn techniques for managing emotions effectively, such as deep breathing and mindfulness.
  - Exercise: Practice deep breathing for 5 minutes. Write down how this affects your emotional state.
- Session 8 (30 minutes):
  - Content: Explore the relationship between emotional regulation and mental flexibility.
  - Exercise: Keep a journal for one day, noting your emotional responses to various situations. Reflect on how you could regulate these emotions differently.
- Session 9 (30 minutes):
  - Content: Techniques for staying calm under pressure.
  - Exercise: Simulate a challenging scenario (e.g., presenting in front of a group) and practice regulating your emotions while preparing for it.

Week 4: Problem-Solving Skills

- Session 10 (25 minutes):

- Content: Develop problem-solving skills as a key component of mental flexibility.
- Exercise: Solve a small daily problem using the "define-analyze-solve" framework.

- Session 11 (30 minutes):
  - Content: Enhance creativity in problem-solving by exploring unconventional solutions.
  - Exercise: Brainstorm five unique solutions to a common problem (e.g., forgetting something important).
- Session 12 (30 minutes):
  - Content: Apply problem-solving strategies to academic or personal challenges.
  - Exercise: Identify a current challenge and break it into smaller, manageable steps. Track your progress over the week.

Week 5: Creativity Enhancement

- Session 13 (25 minutes):
  - Content: Understand the role of creativity in mental flexibility.
  - Exercise: Draw or write about a situation from a completely different perspective (e.g., as if you were a character in a story).
- Session 14 (30 minutes):
  - Content: Techniques for fostering creative thinking, such as mind mapping and brainstorming.
  - Exercise: Create a mind map for a project or assignment, focusing on diverse ideas rather than traditional solutions.
- Session 15 (30 minutes):
  - Content: Practical exercise to enhance creativity in daily tasks.
  - Exercise: Redesign a routine activity (e.g., studying or organizing notes) in a new way. Reflect on the outcome.

Week 6: Openness to New Experiences

- Session 16 (25 minutes):
  - Content: Importance of being open to new experiences and perspectives.
  - Exercise: Try a new hobby or activity outside your comfort zone. Write about your experience.
- Session 17 (30 minutes):
  - Content: Strategies for embracing uncertainty and change.
  - Exercise: List three things you are afraid to try. Choose one and create a step-by-step plan to overcome this fear.
- Session 18 (30 minutes):
  - Content: Building resilience through openness to new experiences.
  - Exercise: Engage in a group discussion about a controversial topic. Focus on understanding opposing viewpoints without judgment.

Week 7: Integrating Mental Flexibility Components

- Session 19 (25 minutes):
  - Content: Combine cognitive adaptability and emotional regulation in real-life scenarios.
  - Exercise: Role-play a situation where you must adapt quickly to unexpected changes. Reflect on your emotional and cognitive responses.
- Session 20 (30 minutes):
  - Content: Use problem-solving and creativity together to address complex challenges.
  - Exercise: Work in groups to design a solution for a hypothetical community issue. Present your ideas and receive feedback.
- Session 21 (30 minutes):
  - Content: Practical exercise to integrate all components of mental flexibility.
  - Exercise: Plan and execute a small activity that requires adaptability, creativity, and emotional regulation (e.g., organizing a short class presentation).

Week 8: Evaluation and Future Application

- Session 22 (25 minutes):
  - Content: Evaluate personal progress in mental flexibility across the five dimensions (cognitive adaptability, emotional regulation, problem-solving, creativity, and openness).
  - Exercise: Complete a self-assessment questionnaire based on the program's objectives.
- Session 23 (30 minutes):
  - Content: Develop a future plan for maintaining and enhancing mental flexibility.
  - Exercise: Write a detailed action plan for applying mental flexibility strategies in your daily life over the next month.
- Session 24 (30 minutes):
  - Content: Closing session to discuss experiences, challenges, and achievements during the program.
    - Exercise: Write a letter to your future self, highlighting key insights and improvements gained from the program. Share one takeaway with the group.