

Understanding Mental Toughness in Student-Athletes: Insights from Sport Psychology Comprensión De La Fortaleza Mental En Estudiantes-Atletas: Conocimientos De La Psicología Del Deporte

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Abstract. Creating successful athletes has four main aspects: physical, technical, tactical, and psychological. This research focused on the psychological aspects of athletes. Psychological aspects are fundamental in determining successful sporting achievements, one of which is the aspect of mental toughness. Mental toughness is one of the factors that can influence the psychological state of athletes during training and competition, especially for students, so it can help athletes display their best performance. The objective of this research was to assess the mental toughness of student-athletes while they are practicing and competing, which was closely linked to their level of achievement. The study consisted of 275 student-athletes as subjects, and the data was collected using a questionnaire that consisted of the Mental Toughness scale. Results: The mental toughness of student-athletes was low, and mental toughness was not dependent on the athlete's level of competition. However, it is expected that athletes competing at the national level would have higher levels of mental toughness than those at lower levels due to their increased experience in competition. Conclusion: This research suggested that the government should collaborate with sports psychologists to improve mental health among student-athletes to help them achieve the best performance, which leads to becoming champions in various sports categories. These findings provided a basis for further investigation.

Keywords: Sport, Psychology, Mental Toughness, Student-Athlete.

Resumen. Crear atletas exitosos tiene cuatro aspectos principales: físico, técnico, táctico y psicológico. Esta investigación se centrará en los aspectos psicológicos de los deportistas. Los aspectos psicológicos son fundamentales para determinar los logros deportivos exitosos, uno de los cuales es el aspecto de la fortaleza mental. La fortaleza mental es uno de los factores que puede influir en el estado psicológico de los deportistas durante el entrenamiento y la competición, especialmente en el caso de los estudiantes, para que pueda ayudar a los deportistas a mostrar su mejor rendimiento. El objetivo de esta investigación es evaluar la fortaleza mental de los estudiantes-atletas mientras practican y compiten, lo cual está estrechamente relacionado con su nivel de logro. El estudio incluyó a 275 estudiantes-atletas como sujetos y los datos se recopilaron mediante un cuestionario que consistía en la escala de Fortaleza Mental. Resultados: La fortaleza mental de los estudiantes-atletas es baja y parece que la fortaleza mental no depende del nivel de competencia del atleta. Sin embargo, se espera que los atletas que compiten a nivel nacional tengan niveles más altos de fortaleza mental que aquellos en niveles más bajos debido a su mayor experiencia en la competencia. Conclusión: Esta investigación sugiere que el gobierno debería colaborar con los psicólogos deportivos para mejorar la salud mental de los estudiantes-atletas para ayudarlos a lograr el mejor rendimiento, lo que los lleve a convertirse en campeones en diversas categorías deportivas. Estos hallazgos proporcionan una base para una mayor investigación.

Palabras clave: Deporte, Psicología, Fortaleza Mental, Estudiante-Deportista, Rendimiento.

Fecha recepción: 10-10-23. Fecha de aceptación: 19-01-24

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Introduction

Achievement sports refer to activities that are professionally managed to attain optimal performance in sports. The goal is to form and develop potential athletes with a gradual and continuous approach through competition based on agreed-upon terms. These activities are supported by the use of science and technology in sports to achieve accomplishments (Nissa & Soenyoto, 2021). Athlete performance is boosted not just by physical condition, tactics, and technique but also by mental factors (Martínez Lorca et al., 2023). According to Martínez-Lorca et al. (2023), increased levels of psychological stress can negatively impact an athlete's emotional control profile. Therefore, the sports psychology approach focuses on enhancing athletes' mental resilience and emotional intelligence, with the ultimate goal of improving their physical and mental well-being and, consequently, their performance.

According to research conducted by four student-

athletes in Canada, around 20% of them suffer from severe mental problems and psychological distress. Student-athletes face unique challenges and needs that differ from their non-athlete counterparts. They spend over twenty hours per week in training, experience bodily injuries and fatigue, and miss many classes during their sporting season (Sullivan et al., 2019). Moreover, they are expected to perform well in class and earn grades high enough to maintain their eligibility to play collegiate sports (Trendafilova et al., 2010). One of the problems that often leads to student athletes' psychological problems and pressures is when they get injured (Putukian, 2016). A dual career as a student-athlete brings together many commitments and obligations. However, the benefits and positive relationships that exist make student involvement in high-performance sports certainly pose many challenges (Maciel et al., 2022).

Athletes' appearance during a match is linked to their behavior and psychological state, according to Fauzee et al. (2012). A psychological approach to enhancing sports

performance can positively impact motivation, self-confidence, self-perception, mental toughness, and self-development, as suggested by Zapata Huenullán et al. (2023). Mental strength is a psychological factor that can help athletes stay motivated and in control during training or competition, as noted by Bae & Cho (2021). Jannah et al. (2018) explain that mental toughness can be developed through techniques such as goal-setting, self-talk, imaging, and relaxation exercises, which can help reduce or eliminate competition anxiety. Sports coaches and physical education teachers can use self-talk and mental imagery strategies to enhance motor learning (Komaini et al., 2021), sports performance, and psychological skills of young beginner student-athletes. These strategies can be used separately or in combination to control the focus on relevant processes during sporting activity. Young beginner student-athletes can effectively use self-talk and mental imagery techniques when they are learning new motor skills by adapting the learning process's structure. Relaxation techniques can also be combined with self-talk and imagery to enhance sports performance (Hidayat et al., 2023; Birrer & Morgan, 2010).

Mental toughness is a combination of qualities that enable a person to prepare both physically and mentally to overcome challenging training and competitive situations. Athletes with mental toughness possess disciplined thinking and remain calm, focused, and energized under pressure or competition; they can trigger positive energy flows even in adverse conditions (Meizara & Dewi, 2018). Mental toughness is consistently cited by athletes, coaches, and sports psychologists as one of the most critical psychological traits associated with success in elite sports (Cowden, 2017). Athletes value and are motivated by high-quality service offered in sports facilities, especially by their coach, and tend to perform better when their coach participates in athletic activities with simple instructions or gives importance to their needs (Aznar-Ballesta & Vernetta, 2023; Guojie, 2021).

Studies have shown that mental toughness and competition anxiety are negatively correlated. In other words, the higher the mental toughness of a student-athlete, the lower their anxiety levels will be, and vice versa. This has been supported by research conducted by Jannah et al. (2018) and Wolter et al. (2021). Further studies are needed to replicate these findings with larger and more diverse groups of subjects. Additionally, it would be beneficial to explore whether the development of motor skills (physical) and cognitive function (mental/mindset) can promote holistic development in both athletes and non-athletes, as suggested by Trecroci et al. (2021).

Student-athletes experience stress in their daily lives in various ways. They are more likely to seek help from non-team support staff rather than coaches and team-related support staff. This is because they do not want to be seen as harmful by their team (Cutler & Dwyer, 2020). The active participation of student-athletes in sports and

representing themselves in sports tournaments can result in unsatisfactory academic performance. One of the causal factors for this scenario is the mental toughness of the student-athletes, which is often perceived as weak and can negatively influence their learning performance (Samsudin et al., 2021).

The mental well-being of student-athletes has garnered more attention, which could be due to several factors. However, indeed, the increasingly publicized student-athlete suicides, like the University of Pennsylvania's track and field athlete Madison Holleran and Washington State's quarterback Tyler Hilinski, have shined a light on the struggles of student-athletes beyond their on-field performance and academics (Cutler & Dwyer, 2020). According to research conducted in Indonesia, athletes who participate in swimming, soccer, and futsal possess a very high level of mental toughness. On the other hand, athletes in pencak silat and futsal have a high level of mental toughness. While male athletes have a higher average score than female athletes, the difference is not significant.

Similarly, athletes in individual sports have a higher average score than those in team sports, but there is no significant difference (Pujianto et al., 2022). Student-athletes face pressure from both sporting and academic expectations, such as school exams. As a result, athletes must cultivate a strong mental attitude to perform to their full potential during matches and other contexts (Komatsu et al., 2021)

According to a study conducted by Bird et al. (2020), mental toughness has a positive association with exercise-related well-being. Additionally, it was found that mental toughness is linked to lower levels of stigma towards mental health disorders in student-athletes. It is important to develop mental toughness and mental health to improve the well-being of student-athletes and reduce the stigma against seeking help (Chaeroni et al., 2021). This study aimed to describe and examine the mental toughness of student-athletes, which is a crucial step in determining training programs. Student-athlete development should be carried out systematically as they are the future national athletes who will represent the country in international sports. It is essential to provide coaching at lower levels to produce national and international athletes. Therefore, further research on mental toughness in student-athletes is necessary.

Materials and Methods

This research involved surveys through questionnaires to collect data. The questionnaire consisted of demographic questions such as age, gender, sport of interest, and athlete level.

Apart from these questions, the questionnaire also included a mental knowledge scale to measure the mental endurance of athletes.

Participant

The study was conducted on student-athletes from West Sumatra. The participants numbered 275, aged between 13-26 years. The average age of the participants was 19 years, with a standard deviation of 2.38. The researchers obtained free and informed consent from all participants, as required by ETHIC. The study was approved by Universitas Negeri Padang and assigned the number 238/UN.35/LT/2022. The researchers collaborated with several institutions to recruit the participants. They requested assistance from other researchers to distribute the questionnaires to the participants.

Procedure

This research involved the distribution of a questionnaire to collect data from respondents. The first page of the questionnaire contained informed consent, which asked participants if they were willing to take part in the study. Those who were unwilling to participate did not proceed to fill out the questionnaire. The data collection process lasted for three months, from January 2023 to March 2023. We enlisted the help of students, lecturers, and teachers to distribute the research questionnaires to student-athletes they knew, both on campus and at school.

The questionnaire included a mental toughness scale to evaluate the respondent's level of mental toughness. The mental toughness questionnaire from Sheard (2019) was used in this study to measure mental toughness. The questionnaire comprised statements that describe the individual's feelings and beliefs in the context of sports (for example, "I feel happy to try and challenge myself to something new"). The respondent rated their response on a Likert scale ranging from "1 = Strongly Disagree" to "5 = Strongly Agree".

The Mental Toughness Scale was assessed for its reliability using Cronbach's alpha. The analysis revealed a reliability score of $\alpha = .73$, which indicates a good level of reliability. In addition to the scale, the researcher collected some demographic data from the participants, including their age, gender, type of sport, and level of exercise. Personal information such as name, address, and email were not requested to ensure the privacy of the respondents.

Statistical Analysis

The researchers performed data analysis using descriptive statistics. They added up the scores of the mental youth scale dimensions, which include challenges, interpersonal confidence, confidence in abilities, emotional control, life control, and commitment. Afterward, they divided the total mental toughness score into two categories: low and high. This division was based on the mean value of the mental toughness score. Scores higher than the mean were categorized as high, while scores lower than the mean were categorized as low. The

researchers used chi-square analysis to analyze the results of this categorization in relation to the athlete's level (regional, provincial, or national). R statistical software and Microsoft Excel 2016 were used to process the data for this study. Prior to conducting any statistical tests, the researchers performed a normality test on the data they had obtained. The analysis using the Shapiro-Wilk test resulted in a value of 0.253 with $p > 0.05$, indicating that the mental health score was normally distributed.

Results

Table 1 presented statistical information about the six dimensions of mental toughness. The first dimension, known as the Challenge, has an average score of 13.4 and a standard deviation of 1.3. The minimum score for this dimension was 9, while the maximum is 15. The second dimension in consideration here was Interpersonal Confidence, which has an average score of 10.1 and a standard deviation of 1.8. The highest score for this dimension was 14, while the lowest score was 4. The third dimension, Confidence in Abilities, has an average score of 11.6 with a standard deviation of 1.4. The highest score in this dimension was 15, while the lowest was 7. The fourth dimension, Emotional Control, has an average score of 8.7 and a standard deviation of 1.5. The highest score in this dimension was 15, while the lowest was 4. Moving on to the fifth dimension was life control, which has an average score of 11 with a standard deviation of 1.8. The highest score for this dimension was 15, while the lowest was 6. Finally, the sixth dimension, commitment, has an average score of 10 with a standard deviation of 2.1. The highest score for this dimension was 15, while the lowest was 3.

Table. 1
Descriptive statistical results of mental toughness dimensions

Dimension	Mean (standard deviation)	Minimum	maximum
Challenge	13.4(1.3)	9	15
Interpersonal confidence	10.1(1.8)	4	14
Confidence in abilities	11.6(1.4)	7	15
Emotional control	8.7(1.5)	4	15
Life control	11(1.8)	6	15
Commitment	10.1(2.1)	3	15

Table 2 presented the gender distribution of research respondents. The majority of the respondents, 78.5%, were male, while the remaining respondents are female.

Table. 2
Gender of participants in the study.

Gender	N	Percentage
Man	216	78.5%
Woman	59	21.5%

This study included Table 3, which provided information about the level of athletes who participated in the research. Based on the level of athletes, the majority of respondents came from regions with the highest number of athletes, comprising 57.8% provincial level athletes,

21.1% national level athletes, and the remaining 21.1% at the provincial level. The study included a diverse group of participants from 23 different sports around the world. Football was the sport with the highest number of athletes in this study, with 102 out of 275 individuals. Martial arts sports, which included a combination of silat, karate, taekwondo, and several other sports, followed closely behind. The details of all the sports included in the study are mentioned in the following table.

Table 3.

Level Athlete		
Athlete Level	N	Percentage
Region	159	57.8%
Province	58	21.1%
National	58	21.1%

Table 4.

Type of Sport		
Type of Sports	N	Percentage
Football	102	37.1%
Self-defense	44	16.1%
Volleyball	28	10.2%
Futsal	21	7.6%
Athletics	18	5.8%
Basketball	17	6.2%
Badminton	18	6.5%
Swimming	9	3.3%
Sepak takraw	9	3.3%
Table tennis	5	1.8%
Rock climbing	4	1.5%

Table 5 displayed the outcomes of the mental toughness category for student-athletes. According to the study, the mental toughness of student-athletes mostly falls under the low category, i.e., 50.2%. Additionally, only 49.8% of students possess a high mental toughness category. Therefore, it was necessary to provide psychological assistance to student-athletes to enhance their mental toughness, which can help them attain their best performance and achieve noteworthy accomplishments.

Table 5.

Mental Toughness Category		
Mental Toughness Category	N	Percentage
High	137	49.8%
Low	138	50.2%

Table 6 displayed the results of the mental toughness dimensions of the respondents. The high category of the challenge dimension was chosen by 55.3% of the

Table 7.

Cross tabulation of Mental Toughness Category with Athlete Level			
Mental Toughness	Level Athlete		
	Region f (%)	Province f (%)	National f (%)
Low	84(30.5%)	25(9.1%)	29(10.5%)
High	75(27.3%)	33(12.0%)	29(10.5%)

In addition to the previous findings, this study examined the relationship between different dimensions of mental toughness. Table 6 presents the correlation values between various dimensions. The analysis revealed that the challenge dimension has a positive correlation with interpersonal confidence ($r = .18, p < .01$). This

respondents, while the low category was chosen by 44.7%. The interpersonal confidence dimension showed 47.6% of respondents in the high category, while 52.4% were in the lowest category. In the confidence in abilities dimension, 46.5% of respondents were in the high category, and 46.5% were in the low category. Moreover, the emotional control dimension had as many as 56.7% of respondents in the high category, while 43.3% were in the low category.

In the life control dimension, 54.5% of respondents were in the high category, and 45.5% were in the low category. Finally, in the commitment dimension, 44.4% of respondents were in the high category, while 55.6% were in the low category. These results indicated that respondents are more dominant in the low category, the challenge category, and the life control dimension.

Table 6.

Description of the Categories of Mental Toughness Dimensions		
Mental Toughness Dimension Category	N	Percentage
Challenge		
High	123	55.3
Low	152	44.7
Interpersonal confidence		
High	144	47.6
Low	131	52.4
Confidence in abilities		
High	147	53.5
Low	128	46.5
Emotional control		
High	156	56.7
Low	119	43.3
Life control		
High	150	54.5
Low	125	45.5
Commitment		
High	122	44.4
Low	153	55.6

In order to examine the relationship between athletes' mental toughness and their level of mental toughness, a chi-square analysis was conducted. The results of the analysis indicated that there is no significant relationship between the mental toughness category and the athlete's level, as $\chi^2 = 1.6 (p > .05)$. The mental toughness category results were only cross-tabulated with the athlete level and not with the variables of gender and sport since the number of respondents for each category was not balanced. You can find the complete results in Table 5.

indicated that individuals who can handle challenges tend to be more confident in social situations. The challenge dimension also has a positive correlation with confidence in abilities ($r = .28, p < .01$). This suggested that those who are comfortable with challenges are also more likely to feel confident in their abilities, especially in new or unfamiliar situations. Furthermore, the challenge dimension was found to have a positive correlation with the life control dimension ($r = .17, p < .05$). This implies that individuals with good challenge skills also tend to have better planning skills. However, the challenge dimension does not have a significant correlation with emotional control ($r = -.02, p > .05$) or commitment (r

= -.01, $p > .05$). People who enjoy doing new things tend to be easier to get along with in strange and unfamiliar situations, according to the correlation between interpersonal confidence and confidence abilities ($r = .29$, $p < .01$). It may be inferred from this dimension's correlation with emotional control ($r = .21$, $p < .05$) that individuals with a reasonable level of interpersonal confidence also have an easier time controlling their emotions when competing. This component also has a positive correlation with life control ($r = .37$, $p < .01$), indicating that those with a moderate level of interpersonal confidence also have effective planning skills. Furthermore, this dimension also showed a strong correlation ($r = .37$, $p < .01$) with the commitment dimension, indicating that a person with a reasonable level of interpersonal confidence was also likely to do well in tasks. Interpersonal confidence has a strong correlation ($r = .29$, $p < .01$) with confidence abilities, indicating that those who enjoy trying new things are generally easy to get along with in unfamiliar and foreign settings. Moreover, there is a strong correlation between this measure and emotional control ($r = .21$, $p < .05$), suggesting that individuals with a moderate level of interpersonal confidence are more likely to be able to control their emotions under pressure. Individuals with a respectable level of interpersonal confidence also demonstrate good planning abilities, as indicated by the correlation between this measure and life control ($r = .37$, $p < .01$). Furthermore, a person with decent interpersonal confidence is also likely to do well, as indicated by the correlation between this dimension and the commitment dimension ($r = .37$, $p < .01$). The life control dimension and the emotion control dimension correlate $r = .22$ ($p < .05$), indicating that an individual with good emotional control is also likely to have good planning skills. Additionally, there is a correlation between the emotional control dimension and commitment ($r = .24$, $p < .01$), suggesting that those with excellent emotional control also have excellent commitment.

Commitment and the life control component had a positive correlation ($r = .26$, $p < .01$). These findings suggest that people who lead fulfilling lives and make plans for the future also tend to perform well in activities, even in the face of difficulties and roadblocks.

Table 8.

Correlation Between Dimensions of Mental Toughness

Variable	Challenge	Interpersonal confidence	Confidence in abilities	Emotion control	Life control
Interpersonal confidence	.18**				
Confidence in abilities	.28**	.29**			
Emotion control	-.02	.21*	-.11		
Life control	.17*	.37**	.32**	.22*	
Commitment	-.01	.37**	.31**	.24**	.36**

Note: ** $p < .001$; * $p < .05$

Discussion

Athletes are individuals who have developed a high level of proficiency in sports and other physical activities.

They have unique talents, behaviors, personalities, and life experiences that impact them in specific ways (Cha, 2019). A study conducted on the mental toughness levels of athletes at the regional, provincial, and national levels found that they were all similar. The study concluded that there was no significant difference in mental toughness when the level of competition was considered. These results are different from previous studies that focused on demographic variables to assess athletes' mental toughness. For instance, differences in mental toughness have been observed between team and individual sports as well as between male and female athletes. Based on gender, male athletes are generally considered to have higher levels of mental toughness than female athletes (Kumar, 2017).

These findings were intriguing because athletes who have competed at the national level are presumed to have better mental toughness than those who have only competed at the regional and provincial levels. However, further research is required to validate this assumption. Moreover, the study suggests that emotional control is positively related to life control, indicating that athletes with good emotional stability tend to manage their lives better and plan for the future. Furthermore, athletes with good regulatory abilities have a greater tendency to face problems in their lives quickly (Ningtyas & Ediaty, 2020). Emotional stability also contributes to an athlete's perseverance in pursuing success, according to recent research (Gatsis et al., 2021). Additionally, emotional control is directly linked to social values, which are used to respect oneself and other individuals around them (Purnomo et al., 2024). Mental toughness is not just motivation and control over daily practice and competition matters; the power to recover from injuries and setbacks [Recovery and growth from difficulties] such as [the power to turn a challenging situation into an opportunity] and [the ability to turn the unexpected, like an injury into experience] are also significant (Komatsu et al., 2021). Sports psychology plays a vital role in controlling the emotions of sportspersons during practice as well as competition (Adling, 2017). The study found that there was a significant correlation between certain variables related to mental toughness, but not all of them. Specifically, self-confidence was noted as an important factor for athletes to possess in order to achieve their best performance (Sin, 2017). However, the correlation between confidence in abilities and emotional control did not show significant results (Alwin et al., 2020). The study also discussed the relationship between self-confidence and emotional regulation in karate athletes and how self-confidence can reduce feelings of anxiety in elite athletes (Ita et al., 2022).

Motivation and family support are crucial factors that contribute to the ability of young athletes to overcome psychological resistance related to the pressures around school and sports (Flach et al., 2023; Marheni et al., 2019). Mental toughness is defined as the collection of values, attitudes, behaviors, and emotions that strengthen an athlete to survive the pressures and obstacles they face (Nugraha et al., 2020). One of the key contributing factors to mental toughness is self-confidence. Self-confidence is a psychological or mental condition that enables a person to take action with strong conviction (Hidayat et al., 2023). As a student-athlete, it is essential to have high self-confidence to maintain a positive mindset.

The study found that the variables of self-confidence and emotional control are insignificant as the concept of self-confidence differs. In this study, confidence is more focused on athletes' comfort in new situations, while other studies interpret self-confidence as a sense of security, ambition, independence, and self-orientation (Kim & Cruz, 2021). Apart from confidence in abilities, there is also interpersonal confidence, which refers to a person's ability to face complex challenges. The study showed that interpersonal confidence has a significant relationship with emotional control. Previous studies that examined self-confidence with emotional variables were more directed towards interpersonal confidence, not confidence in ability. This means that further research is needed to understand the relationship between emotional stability and interpersonal confidence.

Mental health education and well-being strategies should be a priority for Student-athletes not only to reduce their stress day-to-day but also to reduce the stigma associated with mental health and to increase the use of mental health services. To do so, sports departments should consider (1) adding an embedded mental health and wellness curriculum, including strategies to manage stress and anxiety, (2) creating mentorship programs for student-athletes to understand the real feelings of student-athletes as opposed to the stigma narrative, and (3) forming group sessions for athletes to start the conversation and build support groups around the subject (Cutler & Dwyer, 2020). According to the study, the majority of the respondents have a low level of mental toughness. Men dominate the respondents in this study, and it is mentioned that men generally have higher mental toughness than women (Nicholls et al., 2009). The mental toughness of the student-athletes in this study should have been in the high category as men dominate it. These findings suggested that the mental toughness of student-athletes still needs improvement.

Coaches need to understand the characteristics of athletes through communication to determine the athlete's mental health (Deborah et al., 2023).

Conclusions

The present study indicated that mental toughness is positively related to higher levels of sport-specific psychological well-being and performance among athletes. However, the mental toughness of student-athletes was generally low, and there presented to be no significant difference in mental toughness based on the athlete's level of competition. It was believed that mental toughness in athletes who compete at the national level should be higher than that of athletes at lower levels because the experience of competing at a higher level is thought to increase mental toughness in student-athletes. To summarize, integrating emotional intelligence and mental health education into sports can enhance the benefits of exercise for personal resilience. Participating in sports has been found to have a positive impact on mental health and well-being. Therefore, coaches and parents can provide additional support to children with mental health and learning disorders to help them succeed in sports.

Acknowledgments

The authors express their gratitude to Universitas Negeri Padang, Universiti Pendidikan Sultan Idris, and their supervisor, Assoc Prof. Zulakabal Abd Karim, for their support and guidance throughout this work.

Conflicts of Interest

The authors declare no conflicts of interest with regard to the research, authorship, and publication of this article.

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