

The Role of Mental Toughness in Improving Achievement: The Perspective of Sport Psychology on Student-Athletes

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Abstract The psychological aspect is essential in determining success in sports. Mental toughness is one factor that can affect athletes' psychological state during training and competition. Mental toughness can play an essential role in managing and minimizing the anxiety of athletes in competing athletes so that it can help athletes be able to show their best performance. This study aims to determine the mental toughness of student-athletes to improve achievement in sports. This type of research is survey research, using questionnaires in the data collection process. The questionnaire contains several demographic questions about respondents: age, gender, sport involved, and athlete level. Respondents in this study were student-athletes from West Sumatra with a total of 128 people, with an average age of 13-24 years, and all participants signed the free and informed consent term (ETHIC). Data collection uses a questionnaire consisting of a Mental Toughness scale. The mental toughness of student-athletes was in a low category, and there was no difference in mental toughness regarding the athlete's level of competition. Mental toughness in athletes competing at the national level should have a higher score than athletes at lower levels because variations in competing experience are thought to increase the mental toughness of

student-athletes. This research implies the government's crucial role in working with sports psychologists to improve mental awareness among student-athletes.

Keywords Mental Toughness, Achievement, Student-Athlete, Sport Psychology

1. Introduction

Achievement sports are sports activities carried out and managed professionally intending to obtain optimal performance in sports, form and develop potential athletes with a gradual and continuous concept through competition according to agreed terms to achieve achievements with the support of science and technology sports [1],[2]. Achievement and quality of athletes are not only related to physical condition, tactics, and technique alone, but mental factors are also integrated into improving athlete performance. The sports psychology approach aims to increase athletes' mental resilience and emotional intelligence; thus, it is hoped that mentally and physically healthy athletes can improve their performance [3],[4].

The research results by four student-athletes in Canada stated that around 20% had severe mental problems and psychological distress. Student-athletes have problems with unique challenges and needs that are different from their non-athlete counterparts, such as spending more than twenty hours per week in training, experiencing bodily injuries and fatigue, and missing many classes during their sporting season [5],[6]. They are also expected to perform well in class and earn strong enough grades to maintain their eligibility to play collegiate sports [7]. One of the problems that often contribute to student athletes' psychological problems and pressures is when they are injured [8].

The appearance of an athlete in a match cannot be separated from the behaviour and psychological aspects that underlie it [9],[10]. One of the psychological aspects that can provide motivation and positive feelings so that athletes can control themselves and make decisions to achieve peak performance in training or competition conditions is mental toughness [11],[12],[13]. Mental toughness can be trained to reduce and eliminate competition anxiety with goal setting, self-talk, imagery, and relaxation exercises [2]. According to Nisa and Jannah [14], mental toughness appears as a set of attributes that enable a person to be physically and mentally prepared to overcome complex training and competitive situations. Mental toughness in athletes is mentally challenging as a disciplined thinker who remains calm, undisturbed, and energized, regardless of pressure or competition; this is because they can trigger positive energy flows in bad conditions [15]. Athletes, coaches, and applied sports psychologists consistently cite mental toughness as one of the most important psychological characteristics associated with outcome and success in elite sports [16],[17].

In the last few decades, scientists and practitioners have extensively studied the concept of mental toughness to support athlete performance [18]. Mental toughness correlates with competition anxiety; increasing mental toughness will reduce athletes' competition anxiety [19]. According to Jannah et al. [20], the higher the mental Toughness a Student-Athlete has, the lower his anxiety will be, and vice versa. Further replication of the study in a broader group of subjects or even testing that motor skills (physical) and cognitive function (mental/mindset) are the same basis for promoting holistic development in both athletes and non-athletes [21].

This study will examine and describe the mental toughness of student-athletes. This is important as a first step in determining training programs, both specifically and in general. Student-athlete development must be carried out systematically because student-athletes are the forerunners of national athletes who will become the country's pride in national and international sports. It is only possible to produce national and international athletes, such as school-age athletes, with coaching at the lower levels. Therefore, further research on Mental Toughness in Student-Athletes is necessary.

2. Methodology/ Materials

2.1. Research Design

This type of research is survey research, using questionnaires in the data collection process. The questionnaire contains several demographic questions about respondents: age, gender, sport involved, and athlete level. In addition to demographic questions, the questionnaire also contains a mental knowledge scale to measure the mental endurance of athletes. Data analysis is done with the help of R software.

2.2. Participants

Respondents in this study were student-athletes from West Sumatra with a total of 128 people, with an average age of 13-24 years, and all participants signed the free and informed consent term (ETHIC). This research is eligible to conduct and continue from Universitas Negeri Padang with a number (238/UN.35/LT/2022). The description of the mental toughness of the respondents shows that 52.7% are in the low category and 47.3% are in the high category. For more details, it can be seen in Table 1. To recruit respondents, the researchers collaborated with several institutions where student-athletes studied. The researcher asked for help from fellow researchers in several places to distribute questionnaires to respondents.

Table 1. Respondents Demographics

Gender	N	Percentage
Man	111	86.7%
Woman	17	13.3%
Sports	N	Percentage
Football	87	68.0%
Futsal	9	7.0%
Volley Ball	8	6.2%
Silat	6	4.7%
Basket Ball	5	3.9%
Athletics	3	2.3%
Karate	3	2.3%
Badminton	2	1.6%
Gate ball	1	0.8%
Rock climbing	1	0.8%
Swimming	1	0.8%
Gymnastics	1	0.8%
Sepak Takraw	1	0.8%
Athlete Level	N	Percentage
Area	59	46.1%
Province	32	25.0%
National	37	28.9%

2.3. Data Collection

This study used a questionnaire as a data collection tool and distributed questionnaires to respondents. The front page of the research questionnaire contains informed consent. Respondents were asked about their willingness to participate in this research. Respondents unwilling to participate in the study did not continue filling out the questionnaire. The data collection process was carried out for three months from date to date.

Furthermore, the questionnaire contains a scale to measure the mental toughness level of the respondent. This study uses a scale of McGeown [31] to measure Mental Toughness. Items consist of statements that describe a person's feelings and beliefs in the context of sport (e.g., "I feel happy to try and challenge myself to something new"). The response is a Likert scale of "1 = Strongly Disagree" to "5 = Strongly Agree". The reliability of Cronbach's alpha obtained by this scale is $\alpha = .66$. Apart from the scale, the researcher also captured some of the demographic data of the respondents for analysis purposes, such as age, gender, type of sport and level of exercise. Personal identification such as name, address and e-mail are not asked to protect the respondent's privacy. However, the cellphone number is still taken because it is for the benefit of sending rewards. Ten respondents were randomized to get a reward. Rewards are sent in the form of internet quota packages. Mobile phone number data is used only for sending rewards, and researchers guard the privacy of respondents.

3. Results

This data analysis begins with knowing the reliability and then calculating the total score to see the value of mental toughness in athletes. Scores below the mean are made into the "low" category, and scores above or equal to the mean are made into the "high" category. The results of the mental toughness level category can be seen in Table 1.

Table 1 describes the description of the research respondents. As many as 87% of respondents are male, and the rest are female. Men dominated respondents in this study. Respondents in this study also came from various types of sports, but students who pursued football dominated the sport. Judging from the level of athletes, most respondents came from regions with the highest number, namely 46%, provincial level athletes at 25%, and the rest at the national level at 29%.

In table 2, we can see the results of this study show that the mental toughness category of student-athletes is mainly in the low category, namely 52%. Furthermore, students with a low mental toughness category are as much as 48%. So psychological assistance is needed for student-athletes to improve their mental toughness to get their best performance and achieve brilliant achievements.

In table 3 we can see the relationship between athletes' mental toughness using chi-square. The results of the chi-square analysis showed $\chi^2 = 4.02$ ($p > .05$), which

means there is no relationship between the mental toughness category and the athlete's level. Furthermore, the mental toughness category results were cross-tabulated with the athlete level and not carried out with the variables of gender and sport because the number of respondents for each category was not balanced. For complete results can be seen in Table 5.

Table 2. Mental Toughness Category

Mental Toughness Category	N	Percentage
High	61	47.7%
Low	67	52.3%

Table 3. Cross tabulation of Mental Toughness Category with Athlete Level

Mental Toughness	Level Athlete		
	Region f (%)	Province f (%)	National f (%)
Low	35(27%)	12(9.4%)	20(15.6%)
High	24(18.8)	20(15.6%)	17(13.3%)

The results of the categories for each mental toughness dimension can be seen in Table 4. The challenge dimension shows that 42.64% of respondents are in the high category, and 57.36% are in the low category. There were 58.14% of respondents on the dimension of interpersonal confidence in the high category, and 41.84%, were in the lowest category. On the confidence in abilities dimension, 51.94% of respondents are in the high category, and 48.06% are in the low category. As many as 60.47% of respondents were in the high category on the emotional control dimension, while 39.53% were in the low category. As for the life control dimension, 41.09% of people are in the high category, and 58.91% are in the low category. On the commitment dimension, 50.39% of people are in the high category, while 49.61% are in the low category. From these results, it can be seen that in the challenge category and the life control dimension, respondents are more dominant in the low category.

Furthermore, this study also looked at the correlation values between dimensions of mental toughness and the results are shown in Table 5. Based on the analysis, the challenge dimension positively correlates with interpersonal confidence $r = .27$ ($p < .01$), meaning that a person who can develop themselves tends to explore new things. The challenge dimension also correlates with confidence in abilities $r = .25$ ($p < .01$), meaning that people with a good challenge feel comfortable in unfamiliar situations or are new to competing. The challenge dimension also correlates with the life control dimension $r = .18$ ($p < .05$), meaning that people with good challenges also have careful planning. However, the challenge dimension does not show a correlation with the emotional control dimension $r = -.03$ ($p > .05$) and commitment dimension $r = -.02$ ($p > .05$).

Table 4. Description of the Categories of Mental Toughness Dimensions

Mental Toughness Dimension Category	N	Percentage
Challenge		
High	55	42.64
Low	74	57.36
Interpersonal confidence		
High	75	58.14
Low	54	41.84
Confidence in abilities		
High	67	51.94
Low	62	48.06
Emotional control		
High	78	60.47
Low	51	39.53
Life control		
High	53	41.09
Low	76	58.91
Commitment		
High	65	50.39
Low	64	49.61

Table 5. Correlation Between Dimensions of Mental Toughness

Variable	Challenge	Interpersonal confidence	Confidence in abilities	Emotion control	Life control
Interpersonal confidence	.27**				
Confidence in abilities	.25**	.29**			
Emotion control	-.03	.19*	.01		
Life control	.18*	.41**	.26**	.22*	
Commitment	-.02	.25**	.33**	.26**	.26**

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

Interpersonal confidence correlates with confidence abilities $r = .29$ ($p < .01$), which means that people who like new things tend to be easy to deal with in a foreign and new environment. This dimension also correlates with emotional control $r = .19$ ($p < .05$), meaning that people with reasonable interpersonal confidence tend to manage their emotions when competing easily. This dimension also correlates with life control $r = .41$ ($p < .01$), meaning that people with reasonable interpersonal confidence also show good planning abilities. In addition, this dimension also correlates with the commitment dimension $r = .25$ ($p < .01$), which means that someone with reasonable interpersonal confidence also tends to carry out tasks well.

The dimension of confidence in abilities is not correlated with the dimension of emotional control $r = .01$ ($p > .05$). The dimensions of abilities show a correlation with life control $r = .26$ ($p < .01$) and commitment $r = .33$ ($p < .01$). These results indicate that someone who is comfortable with unfamiliar situations and new to matches tends to have good planning to carry out tasks successfully.

The emotion control dimension correlates with the life

control dimension $r = .22$ ($p < .05$), which means that someone who can control his emotions tends to be able to plan things well too. The emotional control dimension also correlates with commitment $r = .26$ ($p < .01$), which indicates that people who can control their emotions have an exemplary commitment.

The life control dimension positively correlates with commitment $r = .26$ ($p < .01$). These results indicate that someone with a good life and future planning also tends to carry out tasks well despite problems and obstacles to solving them.

4. Discussion

An athlete is someone proficient in sports and other forms of physical exercise. Athletes have talents, behaviour patterns, personality patterns, and life backgrounds that affect them specifically. The results showed that the level of mental toughness and the level of athletes at the regional, provincial, and national levels were

the same. The results of this study stated that there was no difference in mental toughness when viewed from the level of competition. These results differ from previous studies regarding athletes' mental toughness based on demographic variables. According to research by Syah and Jannah [22], seeing differences in mental toughness based on team and individual sports while looking at differences in mental toughness based on gender, male athletes can be considered superior to female athletes in all aspects that affect Mental toughness [23].

Students who participate in sport activities are based on their interests and talent so they can develop their potential [33]. This result is interesting because athletes who have competed at the national level should have better mental toughness than those who have competed at the regional and provincial levels. However, these results need further research because the research to discuss this is still limited. Furthermore, the correlation between dimensions of mental toughness shows that emotional control is positively correlated with life control. This study's results state that athletes with good emotional stability tend to easily manage their lives, for example, when planning for the future. These results align with research conducted by Dawenan et al. [24], which states that athletes with good regulatory abilities tend to face problems in their lives quickly [24]. Emotional stability also plays a role in helping athletes to keep trying to achieve success [25].

In addition to the significant correlation results, the dimensions of mental toughness also showed insignificant results. The correlation between confidence in abilities and emotional control did not show significant results. These results differ from previous studies, such as those conducted by Pandini [26], which stated that self-confidence is an important variable that must be possessed by athletes whose function is to develop psychological abilities to bring about performance—the maximum [26]. Based on research conducted by Alwin [27], and Manah and Jannah [28], meanwhile, there is also a relationship between self-confidence and emotional regulation in karate athletes. At the same time, it states that self-confidence can also reduce feelings of anxiety in national athletes [29].

The collection of values, attitudes, behaviours, and emotions that strengthen an athlete to survive the pressures and obstacles a person faces can be interpreted as Mental Toughness [19]. One thing that influences mental toughness is self-confidence. Self-confidence is also a psychological or mental condition that can give a person strong confidence to take action [14]. As a Student-Athlete, you must also have high self-confidence to have high thoughts. The coaches need understanding the influencing factors of student athlete physical activity that affects motor skills to achievement [35].

The variable of self-confidence and emotional control in this study is insignificant because the concept of self-confidence differs. Confidence in this study is more directed toward athletes' comfort in new situations.

Meanwhile, some research interprets self-confidence as a sense of security, ambition, independence and self-orientation [30], [31]. Apart from confidence in abilities, there is also interpersonal confidence which refers to a person's ability to try complex challenges. Interpersonal confidence shows significant results with emotional control. Previous studies that examined self-confidence with emotional variables were more directed at interpersonal confidence, not confidence in ability. It also means that studying the relationship between emotional stability and interpersonal confidence still needs to be widely explored. Interpersonal skill needs and importance are also widely used based on team or individual sports [32].

Sport and education is a learning process that is held interactively, inspiring, fun, challenging, motivating student to be active, and providing sufficient space so that student are creative and independent according to their talents, interests, physical and psychological development [34]. Another result of this study is that most respondents have a low level of mental toughness. This study has respondents that men dominate. It is stated that men have higher mental toughness than women [23], [30]. The mental toughness from the results of this study should be in the high category because men dominate it. These results indicate that the mental toughness of student-athletes still has problems. Through the role of sports achievement, it can increase student motivation to actively engage in sports and be positive person in the future [36].

The limitation of this research is the small number of female respondents involved. This is because the number of female athletes is still small. Even though information related to the description of mental toughness in women is also interesting to explore, further research can be done by involving a balanced number of female respondents with males. Exploring women's interest in becoming athletes in Indonesia is also interesting.

5. Conclusions

The results of this study stated that there was no difference in mental toughness at the athlete's level of competition at regional, national, and provincial levels. The mental toughness of athletes competing at the provincial level should be better than that of athletes at lower levels because athletes already at that level have already gone through the previous levels. Nevertheless, the results of this study showed no difference between them. From these results, there is still a problem that has not been answered in this study, namely, why athletes at the national level still have the same mental toughness as lower-level athletes. This research implies the government's role in working with sports psychologists to improve student-athletes' mental awareness in Padang. These results can be a recommendation for further research to explore what factors play a role in the similarity of this level of

mental toughness. In addition to exploring mental toughness in various sports, looking at comparisons of mental toughness between individual and team sports and looking at mental toughness based on gender is another important research recommendation that is important to do

Limitations

This research is only limited to knowing and seeing the mental toughness of student-athletes to improve achievement in sports. This type of research is survey research, using questionnaires in the data collection process. So, there are still some problems that also arise as a result of this research. Research using a questionnaire consisting of a Mental Toughness scale carries out dissemination and promotion as a form or way of introducing and disseminating information to the public about mental toughness student athletes. This includes not researching more deeply about how people with student athletes interact in society, other psychology problems and other ways (training, abilities and achievements). Another limitation of this research is the use of participants. The fairly wide age range of the participants may influence the results in this research. Therefore, it is recommended for future researchers to consider participant groups in future research.

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