

Do Age, Gender, and Match Experience Affect the Mental Toughness of Martial Art Athletes?

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Abstract Mental factor is one of the factors that should be prepared to achieve high performing athlete. In the athlete rehearsal preparation, mental toughness condition needs to be identified to keep the athletes fit when they have some difficulties in a match, feel the pressure during the match, and take behavior control, so that they will not get stressed easily. This study aims to find whether age, gender, and match experience affect the athlete's mental toughness. The study was done to 174 (age = 19.69 ± 2.89) martial art athletes in Bekasi who were preparing themselves for a province/regional level match (PORPROV West Java 2022). Instrument of mental toughness refers to mental toughness dimension namely: control, commitment, challenge, and confidence. Data were analysed by using multiple logistic regression and cross tab. The result shows that mental toughness of martial art athletes was influenced by gender and match experience. Most of them are on the high level of mental toughness, and the majority is the men at the age of 19 to 22 who have experience in doing a national match. In addition, the relationship observed in this study emphasizes the need of coping and optimism training in mental toughness intervention.

Keywords Mental Toughness, Age, Gender, Match Experience, Martial Art

1. Introduction

To achieve peak performance, athletes must have a good mentality. In the training program, mental factor is one of the most important things to be prepared in addition to physical, technical and tactical factors [1]–[3]. During the game, 80% of athletes' success is influenced by mental. One of the mental factors that coaches need to know before developing an athlete training program is mental toughness (MT) which allows individuals to survive through difficult situations [4] for success and health in sports [5], [6]. Good mental toughness will help athletes overcome difficult situations in training and competition, increase determination, focus, confidence and maintain control under pressure [7]. Mental toughness can be developed through appropriate training programs [8].

The higher mental toughness athletes have, the lower anxiety they have in a match [9]. Mental toughness can be influenced by the athlete's competitive experience, [10] so that the spirit will increase, [11] they will be more focused and consistent in achieving goals, [12] and able to cope with pressure, as a result athletes will feel relaxed, calm, and full of positive energy [13].

Mental toughness makes athletes able to eliminate

negative thoughts, so that they can minimize mistakes in competition (Jones, 2002). As a result, mental toughness is very beneficial because it can keep the athletes' performance stable when they face the trouble, feel the pressure, and control emotion, so that they will not be stressed out [14].

Athletes with high mental toughness are those who have faith in their own abilities. They have the ability to rise above their difficulties, believe in their own distinctiveness in comparison to others, have a strong drive to learn more and more, and remain focused on what they accomplish. Furthermore, they can handle themselves in unexpected situations, push their emotional and physical limits, experience nervousness but try to overcome it, and are not easily swayed by the opponent's good or bad match. They continue to improve despite the opponent's push, they continue to focus on resolving issues in their own lives, and they can control their focus in any exercise they require [15].

Mental toughness is made up of several components, which we refer to as the 4C: (1) Control, which refers to an athlete's ability to direct and control themselves in order to achieve their goals; (2) Commitment, which refers to an athlete's commitment to achieving their goals, and tendency to complete tasks and reach goals using their own potential; (3) Challenge, an athlete's tendency to see challenges and difficulties as something they must overcome; and (4) Confidence, an athlete's belief in facing challenges that can cause physical, mental, and verbal decline [16].

Age, gender, and match experience are all factors that influence mental toughness [17], [18] While some studies show that age and gender have no effect on mental toughness, others show that they do [19]. During this study, it will be determined how much mental toughness athlete is influenced by the environment, gender, and the perseverance of the martial art athlete in Bekasi who has preparations for the province/regional level (PORPROV West Java) Competition in 2022.

2. Materials and Methods

2.1. Participant

This study involved 174 martial art athletes in Bekasi who are prepared for multi-events in regional level (PORPROV West Java 2022) as participants. They were then selected purposively; 105 female and 69 male (age = 19.69 ± 2.89) athletes were the samples for this study with different match experience. The sample who has experience in national level consists of 91 respondents (52.3%), while the least respondent goes to the respondents that have experienced competing in an International level. It consists of 10 respondent (5.7%).

Table 1. Distribution of match experience

Match Experience	Total	Percentage
International Level	10	5.7
National Level	91	52.3
Regional Level	33	19.0
Local Level	40	23.0
Total	174	100

2.2. Instrumentation and Measured Parameters

Mental toughness instrument that we used for this study is the instrument that is modified with mental toughness aspect ; control, commitment, challenge, and confidence [16], [20], [21] (see table 2).

2.3. Statistical Analysis

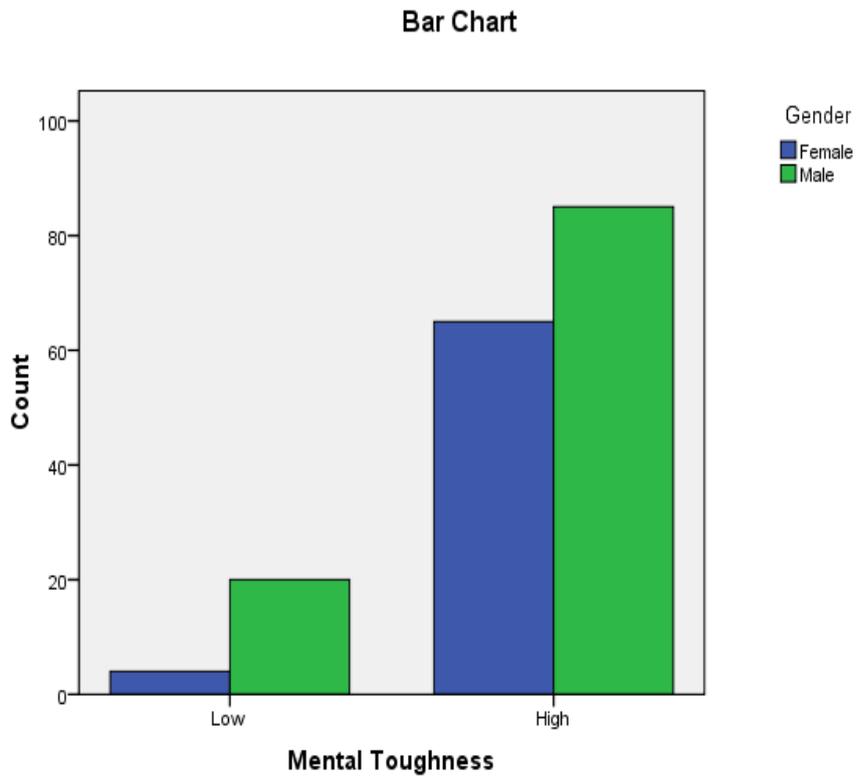
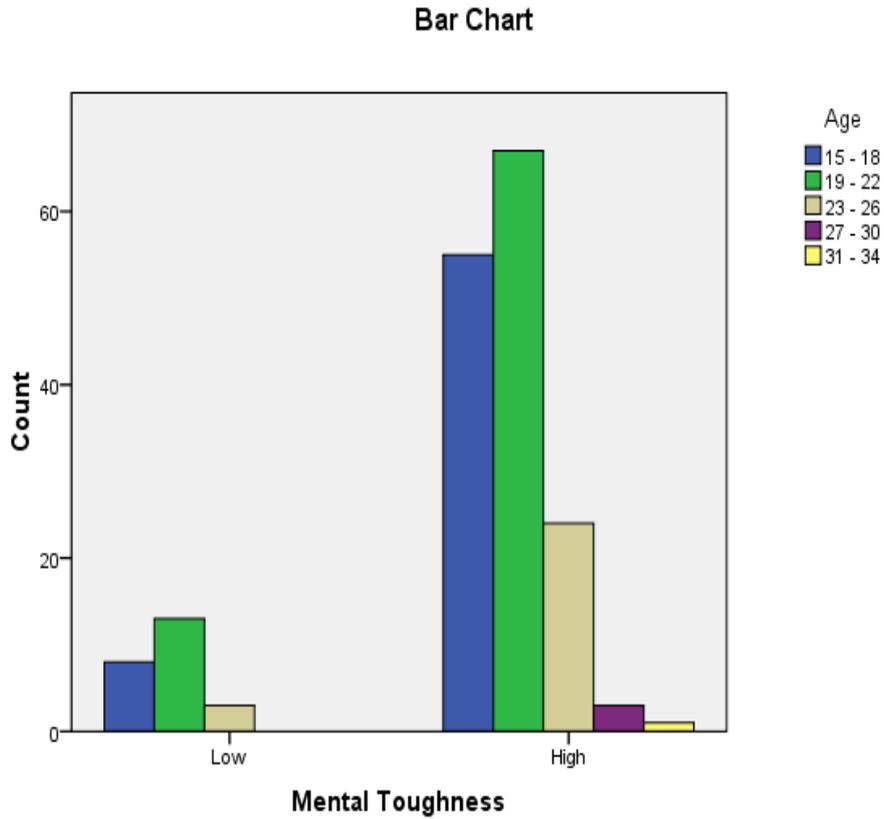
Statistical analysis was calculated using SPSS v26.0 for Windows (SPSS Inc., Chicago, USA). Data analysis technique that we used is descriptive statistics, cross tab, and multiple logistic analysis regression [22]. The acceptable level (2-tailed) of statistical significance was <0.05 .

Table 2. Instrument of Mental Toughness

Dimension	Indicator	No. Item		Total
		Favorable	Unfavorable	
Control	Life control	1	-	1
	Emotional control	2,3,5	4	4
Commitment	Goal setting	6	7	2
	Achieving	8,9	-	2
Challenge	Risk taking	10,11	12,13,14,15	6
	Learning from experience	-	16,17,18	3
Confidence	In abilities	19,21	20	3
	Interpersonal confidence	22,25,26,27	23,24	6
Total		15	12	27

3. Result and Discussion

Based on the grouping of age, gender, and match experience in the two mental toughness categories, this is visually shown in this histogram below.



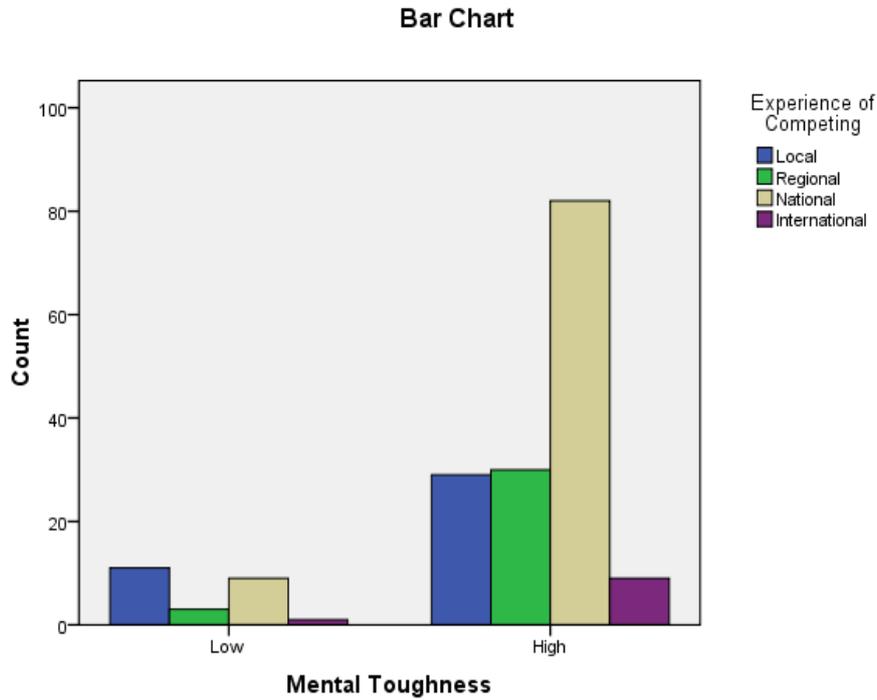


Figure 1. Mental toughness graphic taken from age, gender, and match experience factor

The result of this study shows that the mental toughness of martial art athletes from Bekasi has higher mental toughness (figure 1) visualized in the form of a histogram based on age, gender, and match experience. The cross tab results show that the athletes with higher mental toughness are mostly at the age of 19 to 22 (table 3) who are male (22.9%) and female (15.5%), have experience in competing at the national level (M= 28.7%, F=18.4%) (table 4). The highest and dominant category of mental toughness is commitment (24.1%), and the lowest and dominant category of mental toughness is a challenge (14.8%) (table 5).

Table 3. Crosstab Gender * Age (Number) * Mental Toughness Category

Mental Toughness Category	Gender	Ages (Numbers)					Total
		15 - 18 years old	19 - 22 years old	23 - 26 years old	27 - 30 years old	31 - 34 years old	
Low	Female	0	3	1	0	0	4
	Male	8	10	2	0	0	20
High	Female	25	27	11	2	0	65
	Male	30	40	13	1	1	85
		0%	1.7%	0.6%			2.3%
		4.6%	5.7%	1.2%			11.5%
		14.4%	15.5%	6.3%	1.2%	0%	37.4%
		17.2%	22.9%	7.5%	0.6%	0.6%	48.8%

Table 4. Crosstab Gender * Match Experience * Mental Toughness Category

Mental Toughness Category	Gender	Competing Experience				Total
		Local	Regional	National	International	
Low	Female	0	0	3	1	4
	Male	11	3	6	0	20
High	Female	9	20	32	4	65
	Male	20	10	50	5	85
		0%	0%	1.7%	0.6%	2.3%
		6.3%	1.7%	3.5%	0%	11.5%
		5.2%	11.5%	18.4%	2.3%	37.4%
		11.5%	5.7%	28.7%	2.9%	48.8%

Table 5. Crosstabs Category* Dimensions of Mental Toughness

Variable		Dimensions				Total
		Control	Commitment	Challenge	Confidence	
Mental Toughness	Low	3.1%	0.9%	14.8%	2.8%	21.6%
	High	21.9%	24.1%	10.2%	22.2%	78.4%
	Total	25.0%	25.0%	25.0%	25.0%	100.0%

Table 6. Descriptive Statistics of Mental Toughness

Variable	N	Min	Max	Mean	Std. Deviation
Mental Toughness	174	40	92	71.6	9.87

Table 7. Multiple Logistic Regression of Mental Toughness

Factors	Coef. (B)	Sig. (p)	Exp(B)	Note
Gender	1.246	0.031	3.478	Affected
Age	-0.078	0.804	0.925	Not affected
Competing Experience	0.516	0.040	1.676	Affected

Athletes with high mental resilience can devote themselves to overcoming stress and achieving the best results. The commitment was observed to load most frequently against performance techniques, the findings of this study may represent highly dedicated performers choosing performance improvement tactics. While the challenge is an athlete's tendency to see challenges and difficulties as something they must overcome. Athletes with low mental toughness tend to have high anxiety [23], tend to panic, are afraid to try new techniques, feel that there is no development and feel that their opponent is better than themselves. This is solved by building a mindset wherein challenge is viewed as a positive opportunity rather than a threat [24].

The result of variable descriptive mental toughness statistics on table 6. We can see the mean value of mental toughness is 71.6, standard deviation is 9.87, the highest score is 92, and the lowest one is 40. To measure that it affects gender, age, and match experience of mental toughness, we need to do logistic regression test (table 7). Based on the Multiple Logistics Coefficient, we can conclude that gender, $P = 0.031 < 0.05$, age $P = 0.804 > 0.05$, and competing experience, $P = 0.040 < 0.05$, are important factors in mental toughness. Meanwhile, age has no bearing on an athlete's mental toughness. This is contrary to the results of research which states that age has been demonstrated to impact mental toughness [25].

Mental toughness is a quality that most martial art athletes in Bekasi possess. This study is influenced by a number of things. One of them is that the majority of its athletes have competed in national competitions. According to the findings of the study, match experience had an impact on athletes' mental toughness. Athletes with more experience have stronger mental toughness as well [26], and athletes of county level and above reported considerably stronger mental toughness than

club/university athletes ($t_{105}=2.25, P=0.03$) [40] and This survey's component structure appears to be compatible with the main aspects of mental toughness that have since been found in several qualitative investigations. The findings corroborated earlier research that high-level athletes have better mental toughness martial art athlete [27] because mentally tougher athletes outperform others in terms of achievement [28].

When it comes to mental toughness, martial art athletes in Bekasi who are preparing for PORPROV West Java 2022 are between the ages of 19 and 22, which is considered the top level. The outcome of this investigation is identical to that of the previous one. He claims that 19-year-old athletes have greater mental toughness than competitors under the age of 19. However, it differs from the research conducted by [29]. He claims that athletes between the ages of 30 and 48 have higher mental toughness than athletes between the ages of 18 and 29, and that age influences an individual's mental toughness profile [8]. Meanwhile, we can determine by this study that athletes aged 19 to 22 have the highest mental toughness.

Gender has an impact on athletes' mental toughness [30]. Male athletes are of more mental toughness than female athletes [19], [31], especially when it comes to controlling emotion, life, and self-confidence [17]. Male athletes have more power to overcome challenges in a contest than female competitors [32]. This research, however, differs from that of [29]. He claims that female and male athletes are both of mental toughness.

Mentally strong athletes are able to recover fast and efficiently from stressful situations, such as competitive sports. Athletes' presence of relatively persistent qualities, such as optimism, toughness, and positive affectivity, are highly desirable dispositional inclinations that might predispose a situation-specific reaction. Individuals with high levels of optimism, hardiness, and positive affectivity

prefer to attack a problem with confidence and tenacity [33], [34]. Such people are involved in, and believe they have control over, whatever they are doing, and derive pleasant emotions from their participation [33]–[36]. This viewpoint promotes adaptive solution-focused actions, leading people to believe that the obstacles they face can be solved. Studies on it have shown correlations, but not conceptual differences, between mental toughness and hardiness [37] optimism and positively [33], [38]. Control, commitment [39], challenge, and confidence are all terms used to describe a person's state of mind [21]. Confidence or self-belief, characteristics of control, and thriving on challenges, for example, have all been regularly identified as important components of mental toughness [41]–[43].

4. Conclusions

Based on the result of this research, we can conclude that the mental toughness of 174 martial arts athletes in Bekasi falls into the high category, with criteria ranging from 19 to 22 years old. They are male athletes dominant who have competed at the national level. Control, commitment, challenge, and confidence as important components of mental toughness. The highest and dominant category of mental toughness is commitment, and the lowest and dominant category of mental toughness is challenge. Gender and match experience have an impact on athletes' mental toughness, male athletes have more power to overcome challenges in a contest than female competitors especially when it comes to controlling emotion, life, and self-confidence. Athletes with more experience have stronger mental toughness as well. So a martial arts coach must detect participants' mental toughness by paying attention to gender and match experience so that intervention may be performed. In addition, the relationship observed in this study emphasizes the need of coping and optimism training in mental toughness intervention.

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