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The Relationship of Mental Toughness and Emotional Eating: The Example of a Female Wrestler

Burcu Guvendi[1]
Burcak Keskin[2]
Sema Arslan Kabasakal[3]✉
Selman Kaya[4]

(✉ Corresponding Author)

[1,2,3,4]*Faculty of Sport Sciences, Yalova University, Yalova, Turkey.*
[1]*Email: burcu.guvendi@yalova.edu.tr*
[2]*Email: burcak.keskin@yalova.edu.tr*
[3]*Email: sema.kabasakal@yalova.edu.tr*
[4]*Email: selman.kaya@yalova.edu.tr*

Abstract

Emotional eating is the act of eating to cope with stress and pressure, and it is assumed that this behavior increases as the level of self-control decreases. Several factors, including anxiety about winning and fear of injury, can cause stress in athletes. An athlete's high mental toughness is closely related to their ability to easily cope with such stress factors. It is still a matter of curiosity how negative psychological factors affect emotional eating in athletes with low mental toughness. This study investigated the relationship between emotional eating and mental toughness in female wrestlers. Emotional Eating Questionnaire and Sports Mental Toughness Questionnaire were applied to 69 female wrestlers. The data were analyzed using descriptive statistics, T-test, ANOVA, and Pearson correlation tests. It was found that the participants were low emotional eaters and accepted all of the mental toughness sub-dimensions. There was a significant difference in emotional eating total score and "disinhibition" score according to nationality status ($p<0.05$). The findings suggested a positive and significant relationship between sub-dimensions of emotional eating and sub-dimensions of mental toughness ($p<0.05$). It was concluded that national female wrestlers tended to eat more emotionally than non-national athletes and had more difficulty preventing the urge to eat. As female wrestlers' mental toughness levels increased, they tended to eat emotionally and felt guilty about eating.

Keywords: Eating, Emotional eating, Female wrestlers, Mental toughness, Wrestling, Eating disorder.

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Contents

Contribution of this paper to the literature

Wrestling is a weight sport, and it is a branch of sports that may require calorie restriction and keeping the weight constant during the competition. Depending on this situation, the athlete's eating patterns and eating habits may change, and emotional eating may occur. There is no study in the literature that reveals the emotional eating level of female wrestlers. The aim of this study is to determine the emotional eating levels of female wrestlers and to examine the relationship between emotional eating and mental toughness levels.

1. Introduction & Literature Review

In addition to being a physiological activity essential for survival, nutrition is acknowledged as a physiological and sociological phenomenon (Baysal, 2011; Cengiz, Dijle, Arkan, & Bektaş, 2020). Emotions have a significant impact on eating (Faith, Allison, & Geliebter, 1997). In emotional eating, hunger is not of physiological origin but entirely depends on mood (Bekker, Van De Meerendonk, & Mollerus, 2004). Although the etiology of emotional eating is not well-known, some theories suggest that it may result from early feeding experiences (Macht & Simons, 2011). For instance, children rewarded with candy during childhood prefer to eat them in case of a bad mood when they grow up (Macht, 2008).

Some believe that emotional eating behavior originates in both physiological and psychological mechanisms (Macht, 2008). For example, since consuming foods rich in carbohydrates and poor in protein boosts the effect of serotonin in the body, individuals are likely to consume foods rich in carbohydrates to alleviate depressive moods (Wurtman, 1982). The belief that eating helps to overcome emotional distress may lead to overeating problems (Baumeister & Heatherton, 1996). Sad individuals tend to eat more to improve their mood, which might be due to weak self-control. As they have a low level of self-control and management, they may prefer eating to improve their mood (Tice & Bratslavsky, 2000). Studies have shown that individuals with less coping, emotional regulation, and self-awareness skills have high emotional eating behaviors (Young, 2016). A study on obese individuals revealed that physical exercise was associated with less emotional eating behaviors and high self-control, self-regulation, and improved mood in obese women (Annesi, 2018) which might result from high serotonin levels with exercise (Ünal, 2018). In this sense, athletes are expected to have fewer emotional eating behaviors, but many psychological factors such as the fear of failure, risk of injury, and personal motivation can cause stress in athletes. Mental toughness is closely related to how athletes cope with such distress and achieve sportive success.

It has been suggested by athletes, coaches and sports psychologists that mental toughness is an important psychological factor that ensures sportive success. (Jones, 2002). In the last two decades, significant progress has been made in research on the conceptual uncertainty, definition, and measurement of mental toughness (Stamatis et al., 2020). Although there is no consensus on a clear conceptual framework of mental toughness, some definitions come to the fore in the literature (Erdoğan, 2016). For example, Jones (2002) defines mental toughness as having better coping skills, especially for the demands imposed by sports (e.g., tough competition, training, and lifestyle), and being more consistent, determined, focused, confident, and in control under pressure than his competitors. According to Hardy, Bell, and Beattie (2014) mental toughness is the ability to achieve personal goals under pressure and various stress factors. Middleton, Martin, and Marsh (2012) define it as unwavering determination and belief in a goal despite pressure or negativity. Similarly, Gucciardi, Gordon, and Dimmock (2008) describe it as a set of values, attitudes, behaviors, and emotions that help to resist and overcome any obstacle, adversity, or pressure, as well as to maintain concentration and motivation.

Mental toughness in sports is a factor that helps an athlete cope with anxiety and stress (İhsan, Samet, & Demir, 2020). Athletes need to keep their mental toughness levels as high as possible in the face of adversity (e.g., challenges, stress, failure) to achieve success or recover quickly (Jones, Hanton, & Connaughton, 2007). Studies have shown that the performance of athletes with low mental toughness is poor, although they have proper physiological and technical-tactical functions (Crust, 2008; Jones et al., 2007; Sheard, 2012). Mental toughness facilitates proper behavior and concentration under pressure and thus inevitably boosts performance in athletes (Jones, 2002; Slimani, Miarka, Briki, & Cheour, 2016). Besides, as it helps athletes cope with stress, it can also prevent emotional eating.

In combat sports, constant control of food intake and body weight leads to pressure and stress in athletes, which may also trigger eating disorders (Iuso, Bellomo, Pagano, Carnevale, & Ventriglio, 2019; Soylu, 2021; Sundgot-Borgen & Torstveit, 2004). Studies have shown that dieting causes recurrence of negative moods and emotional problems, and those individuals tend to eat more (Baucom & Aiken, 1981; Grilo, Shiffman, & Wing, 1989). Stress caused by weight control and the fear of failure may increase the emotional eating behaviors in combat sports athletes. In the literature, there is no study on the relationship between wrestling, a combat sport, and emotional eating tendency and mental toughness. The study purpose was reveal the emotional eating levels and mental toughness levels of female wrestlers and to determine the relationship between them.

2. Method

2.1. Procedure

This study was conducted in accordance with the Declaration of Helsinki. All participants were informed about the study processes and an informed consent form was filled in for each participant. The participants were asked to fill out the questionnaires after the necessary information was given.

2.2. Subject

The sample consisted of 69 national and non-national female wrestlers. Table 1 shows the demographic information of the participants. Participation was provided on a voluntary basis and informed consent form was filled by the participants.

Table 1. Demographic characteristics of the participants.

Variables	N	$\bar{x}$	Sd
Age	69	17.78	2.73
Height	69	59.66	10.32
Weight	69	163.13	7.02
Sports year	69	5.63	2.66

2.3. Data Collection Tools

The data were collected using a "Demographic Information Form," "Sports Mental Toughness Questionnaire (SMTQ)," and "Emotional Eating Questionnaire (EEQ)."

Demographic Information Form: It was prepared to obtain information about participants' age, weight, height, sports year, and whether being a national athlete or not. Emotional Eating Questionnaire (EEQ) was developed by Garaulet et al. (2012) to determine emotional eating behaviors. Arslantaş, Dereboy, Yüksel, and İnalkaç (2020) adapted the instrument into Turkish and conducted validity and reliability studies. It is a 4-point Likert type instrument (0=Never, 1=Sometimes, 2=Generally, and 3=Always), including ten items and three sub-dimensions ("disinhibition," "type of food," and "guilt"). There is no reverse item, and it is scored between 0-30. A score of "30" indicates the highest level of emotional eating, and "0" points to no emotional eating behavior. According to Garaulet et al. (2012) if you score between "0-5" points, you are a "non-emotional eater," if "6-10" points, you are a "low emotional eater," if "11-20" points, you are an "emotional eater" and 21-30 points refers that you are a "very emotional eater." Sports Mental Toughness Questionnaire (SMTQ) was developed by Sheard, Golby, and Wersch (2009) to measure mental toughness. Altıntaş and Koruç (2017) adapted it to Turkish and conducted validity and reliability studies. It is 4-point Likert type questionnaire (1=Not at all True; 4=Very True) consisted of 14 items and three sub-dimensions: "confidence" (Items: 1, 5, 6, 11, 13, 14), "constancy" (Items: 3, 8, 10, 12) and "control" (Items: 2, 4, 7, 9)". The participants were sent an online survey link including "Demographic Information Form," "Sports Mental Toughness Questionnaire (SMTQ)," and "Emotional Eating Questionnaire (EEQ). It was voluntary to participate in the survey.

2.4. Data Analysis

The Shapiro-Wilk and skewness and kurtosis tests (Gürbüz & Şahin, 2018) were performed to determine homogeneity. Besides, descriptive statistics (arithmetic mean, standard deviation), t-test, one-way analysis of variance (ANOVA), Scheffe multiple comparison methods, and Pearson correlation tests were performed in the data analysis. The significance value was set at $p<0.05$. The analyses were performed with Statistical Package for the Social Sciences (SPSS) 26.0 (IBM & Armonk, 2019).

3. Findings

In this part of the study, by giving information about the results of the research; our findings are shown with a table and explanations are given under the Table 2.

Table 2. Mean scores.

Tools (n=69)		$\bar{x}$	Sd
Emotional Eating Questionnaire (EEQ)	Inhibition	5.92	3.27
	Type of food	2.52	1.41
	Guilt	2.27	1.35
Emotional Eating Questionnaire Total Score		10.72	5.05
Sports Mental Toughness Questionnaire (SMTQ)	Confidence	17.18	2.71
	Control	11.68	1.89
	Constancy	10.85	1.28

As seen in Table 2, participants accepted scored very high in all the sub-dimensions of the Mental Toughness Questionnaire. The total mean scores in the Emotional Eating Questionnaire show that participants were "low emotional eaters."

Table 3. ANOVA results by age groups.

Tools	Sub-dimensions	Age	N	$\bar{x}$ ± Sd	F	Sd	p
Emotional Eating Questionnaire	Inhibition	15-16	23	5.52±3.64	0.269	2	0.765
		17-18	34	6.08±3.26			
		19 and older	12	6.25±2.73			
	Type of food	15-16	23	2.34±1.40	1.559	2	0.218
		17-18	34	2.41±1.39			
		19 and older	12	3.16±1.40			
	Guilt	15-16	23	2.08±1.23	0.772	2	0.717
		17-18	34	2.35±1.32			
		19 and older	12	2.41±1.72			
	Total Score	15-16	23	9.95±5.24	0.560	2	0.574
		17-18	34	10.85±5.13			
		19 and older	12	11.83±4.54			
Sports Mental Toughness Questionnaire	Confidence	15-16	23	16.39±2.12	2.939	2	0.060
		17-18	34	17.97±2.62			
		19 and older	12	16.50±3.50			
	Control	15-16	23	11.86±2.15	0.180	2	0.836
		17-18	34	11.55±1.61			
		19 and older	12	11.66±2.22			
	Constancy	15-16	23	10.73±1.09	0.173	2	0.842
		17-18	34	10.88±1.29			
		19 and older	12	11.00±1.65			

In Table 3, no statistically significant difference was found in the sub-dimensions and total scores of the EEQ and the sub-dimensions of the SMTQ by age (p>0.05).

Table 4. ANOVA results by the year of doing sports.

Tools	Sub-dimensions	Experience year	N	$\bar{x} \pm$ Sd	F	Sd.	p
Emotional Eating Questionnaire	Inhibition	1-3	13	5.84±3.84	0.367	2	0.694
		4-7	45	5.75±3.29			
		8 years and above	11	6.66±2.67			
	Type of food	1-3	13	2.61±1.55	0.995	2	0.375
		4-7	45	2.36±1.39			
		8 years and above	11	3.00±1.27			
	Guilt	1-3	13	2.30±1.10	0.093	2	0.911
		4-7	45	2.22±1.32			
		8 years and above	11	2.41±1.78			
	Total Score	1-3	13	10.71±5.26	0.547	2	0.581
		4-7	45	10.34±5.08			
		8 years and above	11	12.08±4.81			
Sports Mental Toughness Questionnaire	Confidence	1-3	13	16.53±1.98	0.490	2	0.615
		4-7	45	17.28±2.85			
		8 years and above	11	17.54±2.97			
	Control	1-3	13	12.69±1.49	2.441	2	0.095
		4-7	45	11.40±1.89			
		8 years and above	11	11.63±2.06			
	Constancy	1-3	13	10.69±1.18	2.522	2	0.088
		4-7	45	10.71±1.29			
		8 and above	11	11.63±1.20			

There was no statistically significant difference between EEQ scores and SMTQ scores according to sports year (p>0.05) Table 4.

Table 5. T-test results in terms of being a national athlete.

Tools	Sub-dimensions	Being a national athlete	N	$\bar{x} \pm$ Sd	t	Sd	p
Emotional Eating Questionnaire	Inhibition	Yes	46	6.38±3.66	2.102	65.663	0.039*
		No	23	4.95±1.96			
	Type of food	Yes	46	2.72±1.48	1.763	67	0.082
		No	23	2.09±1.15			
	Guilt	Yes	46	2.38±1.42	0.960	67	0.340
		No	23	2.04±1.21			
	Total Score	Yes	46	11.48±5.59	64.837	67	0.026*
		No	23	9.09±3.11			
Sports Mental Toughness Questionnaire	Confidence	Yes	46	17.32±2.89	0.459	67	0.648
		No	23	17.00±2.39			
	Control	Yes	46	11.58±2.02	-0.555	67	0.580
		No	23	11.86±1.67			
	Constancy	Yes	46	10.71±1.40	-1.558	67	0.124
		No	23	11.22±.869			

Note: *p<0.05.

In Table 5, there was a significant difference in the sub-dimension and total score of the EEQ in terms of being a national athlete (p<0.05), but no significant difference was measured in the other sub-dimensions (p>0.05). There was no statistically significant difference in all sub-dimensions of the SMTQ (p>0.05).

Table 6. Correlation analysis results.

TOOLS (n=69)			Sports Mental Toughness Questionnaire		
			Confidence	Control	Constancy
Emotional Eating Questionnaire	Inhibition	r	-0.051	0.261	0.332
		p	0.676	0.030*	0.005*
	Type of food	r	-0.064	0.244	0.213
		p	0.599	0.043*	0.080
	Guilt	r	0.030	0.416	0.275
		p	0.810	0.000*	0.022*
	Total Score	r	-0.043	0.350	0.349
		p	0.724	0.003*	0.003*

Note: *p<0.05.

As seen in Table 6, there was a low, positive, and significant relationship between the "disinhibition" sub-dimensions of the EEQ, and the "control" and "constancy" sub-dimensions of the SMTQ ($r_{d\text{-}cont}$=0.261, p<0.05; $r_{d\text{-}cons}$=0.332, p<0.05). There was also a low, positive, and significant relationship between the "type of food" and the "control" (r_{cont}=0.244, p<0.05). A moderately positive relationship was found between the "guilt" and the "control" (r=0.416, p<0.05). Similarly, there was a low and positive statistically significant relationship between the "guilt" and "constancy (r=0.275, p<0.05). A low and positive significant difference was found between the EEQ total score and the "control" and "constancy" ($r_{t\text{-}cont}$=0.350, p<0.05; $r_{d\text{-}cons}$=0.349, p<0.05).

4. Discussion

The study examined the relationship between emotional eating behaviors and mental toughness levels of 69 female wrestlers.

Emotional eating is a psychological eating disorder characterized by the tendency to overeat due to negative emotions. Emotional eating is interrelated to certain feelings such as stress, depression, anger, boredom, and happiness, and those at high risk of emotional eating include obese individuals, children, adolescents, those taking weight loss medication, and those that have eating disorders (İnalkaç & Aslantaş, 2018; Sevinçer & Konuk, 2013).

Mental toughness is characterized by competitiveness, resilience to stress, high self-confidence, and low anxiety (Crust & Clough, 2005). The concept of mental toughness for athletes refers to the ability to maintain performance (Mack & Ragan, 2008). Mental toughness is correlated with performance (Crust, 2008).

It was seen that the participants marked all the sub-dimensions of the SMTQ as "Very True" and scored high, which overlaps with the findings of Güvendi, Türksoy, Güçlü, and Konter (2018).

Since wrestling is a weight sport, emotional eating questionnaire was administered. According to the analysis results regarding how wrestling athletes' weight gain and loss affect their eating behavior, the highest mean score was found in the "disinhibition" sub-dimension. The total mean scores from the EEQ show that all female wrestlers in this study were "low emotional eaters."

According to Marchant et al. (2009) mental toughness increases with age. In a study comparing the scores from the SMTQ between the team and individual sports athletes, a significant difference was found in the "control" sub-dimension in favor of team sports athletes by age (Yarayan, Yıldız, & Gülşen, 2018). However, no relationship was found between age and mental toughness in a study conducted on 112 participants who exercised regularly at least twice a week (Crust, 2009). A study on orienteering athletes' mental toughness revealed no significant difference by age as well (Cakmak, 2017). Similarly, no meaningful relationship was observed between age and mental toughness scores of taekwondo athletes under and above the age of eighteen (İhsan et al., 2020). In parallel with these studies, we found no significant difference between age and mental toughness sub-dimensions.

In terms of age's role on emotional eating level, it is found that age did not affect emotional eating (Kubar, 2017). Similarly, no significant relationship was found between age and emotional eating.

Yarayan et al. (2018) observed that the scores obtained from the "control" sub-dimension of SMTQ increased in parallel to the increasing experience (i.e., sports year) in doing individual sports. However, some findings suggest that sports experience did not affect mental toughness in taekwondo athletes (İhsan et al., 2020). A study on young football players found no significant difference between sport start age and mental toughness (Yazıcı, Yapar, Güven, Taşçıoğlu, & Ulutaş, 2021). Another study determined that the mental toughness levels of orienteering athletes were not affected by the sports year (Cakmak, 2017). A study on elite wrestlers found that sports year did not affect their mental toughness (Dede, 2019) which overlaps with our findings and the literature.

In the current study, no significant difference was found between the mental toughness sub-dimensions in terms of being a national wrestler. A study on curling athletes revealed that the national athletes' mental toughness in the "confidence" sub-dimension was higher than those of non-national athletes (Süleymanoğulları & Tozoğlu, 2021). Similarly, elite tennis athletes' mental toughness scores were higher than those of non-elite tennis athletes (Masum, 2014). On the contrary, some findings in the literature suggest that taekwondo athletes' (İhsan et al., 2020) and orienteering athletes' (Cakmak, 2017) mental toughness were not affected by their elite athlete status.

In a study conducted on combat athletes, it was revealed that national athletes scored significantly higher in the sub-dimensions of "disinhibition" and "guilt" compared to non-national athletes (Soylu, 2021). In parallel with these results, this study found that national athletes' total emotional eating scores and "disinhibition" averages were higher than non-national athletes, suggesting that national female wrestlers tend to emotionally overeat and have more difficulty suppressing the urge to eat than non-national female athletes.

When the relationship between the sub-dimensions of the EEQ and the sub-dimensions of the SMTQ was examined, a low-level positive and significant relationship was found between the "disinhibition" sub-dimension of the EEQ and the "control" and "constancy" sub-dimensions of the SMTQ. A similar slightly positive correlation was measured between the "type of food" the sub-dimension of the EEQ and the "control" sub-dimension of the SMTQ. That means that wrestlers with mentally high self-control and concentration tend not to be able to suppress the urge to eat. It can be concluded that despite the high level of mental self-control, wrestlers may crave certain foods such as sweets and may not control themselves in consuming such foods. There was a moderately significant relationship between the "guilt" sub-dimension of the EEQ and the "control" sub-dimension of the SMTQ. A slightly positive and statistically significant correlation was also observed between the "guilt" sub-dimension of the EEQ and the "constancy" sub-dimension of the SMTQ. This result shows that as wrestlers' control and mental toughness levels increase, their emotional guilt about what they eat increases. Another correlational finding pointed to a low and positive significant difference between the EEQ total scores and the "control" and "constancy" sub-dimensions of the SMTQ. Accordingly, it can be inferred that wrestlers tend to overeat emotionally as their mental self-control and concentration potential increase. Since national elite wrestlers train for long duration, they tend to feel much more self-confident in their sports branch and be well-focused on a target, increasing their mental toughness. In turn, long hours of training increase physiological energy needs and calorie intake. If an athlete's nutritional knowledge is insufficient, he may think he is overeating to meet the calorie needs or may prefer simple carbohydrate foods with high-fat content, which can lead to disinhibition (i.e., inability to suppress the urge to eat) and feeling guilty. Therefore, a positive correlation was observed between high emotional eating tendency due to being a national athlete and mental toughness sub-dimensions and the emotional eating total scores and sub-dimension scores. Güngör (2021) found an inverse relationship between nutrition knowledge level and emotional eating. However, this study did not examine participants' nutrition knowledge. Future studies can examine the relationships between mental athletes' toughness, emotional eating behaviors, and nutritional knowledge.

5. Conclusions

As a result, it was determined that as the mental endurance levels of female wrestlers increased, their emotional eating tendencies increased and they felt guilty about the food they ate. At the same time, it has been determined that national female wrestlers have higher emotional eating tendencies compared to non-national women and have difficulty in preventing their desire to eat. Since national elite wrestlers train for long duration, they tend to feel much more self-confident in their sports branch and be well-focused on a target, increasing their mental toughness. In turn, long hours of training increase physiological energy needs and calorie intake. If an athlete's nutritional knowledge is insufficient, he may think he is overeating to meet the calorie needs or may prefer simple carbohydrate foods with high-fat content, which can lead to disinhibition (i.e., inability to suppress the urge to eat) and feeling guilty. Therefore, a positive correlation was observed between high emotional eating tendency due to being a national athlete and mental toughness sub-dimensions and the emotional eating total scores and sub-dimension scores. Güngör (2021) found an inverse relationship between nutrition knowledge level and emotional eating. However, this study did not examine participants' nutrition knowledge. Future studies can examine the relationships between mental athletes' toughness, emotional eating behaviors, and nutritional knowledge.

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