Examination of the relationship between trait anxiety and mental toughness in sailing athletes

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Abstract

This research was conducted to examine the relationship between the trait anxiety levels of national sailing athletes and their mental toughness levels and to investigate the effects of some variables on the athletes' trait anxiety and mental toughness levels. The research universe consists of national athletes competing in different disciplines affiliated with the sailing federation. The sample comprises 32 national athletes (Kitesurfing, windsurfing, and centerboard classes) who voluntarily participated in the research. In addition to the Demographic Information Form, the "Sports Mental Toughness Inventory" and "State-Trait Anxiety Inventory" were used in the research. As a result of the analysis of the data, it was seen that the confidence level of the male athletes was higher than the female athletes, the control levels of the female athletes were higher than the male athletes, and the confidence levels of the kitesurfing athletes were higher than centerboard and windsurfing athletes. In addition, there was a positive and moderate relationship between the age of the athletes and the duration of doing sports and competition. At the same time, there was a negative and moderate relationship between age and the control sub-dimension and between confidence and the control sub-dimension.

Keywords: Centerboard, Kitesurfing, Mental toughness, Sailing, Trait anxiety, Windsurfing.

Contents

Contribution of this paper to the literature
Determining the relationship between national sailing athletes' trait anxiety levels and mental toughness levels, as well as the effects of various variables on these levels of athletes, were the goals of the research. The fact that this sample and variables have not been examined in the literature makes this study unique.

1. Introduction

The search and research of sports scientists to bring athletes to high performance continue intensively. All these quests and researches indicate that the perfection of physical capacity alone is not sufficient in sports performance and that to be successful in the sports environment, it is necessary to be mentally strong as well as physical condition. From this point of view, the issue of mental toughness is of great importance for both athletes and coaches. Concepts such as being able to cope with the stress brought by the competition period, being committed to a determined goal, determination, high concentration, adapting quickly to changing conditions, and being psychologically strong show that mental toughness consists of critical components on the way to success.

2. Literature Review

The fact that mental toughness is seen as a personality trait that reduces the adverse effects of stress and supports adaptability has led researchers to focus on genetic traits and, as a result, to suggest that some people are born resilient, while some studies have also revealed that mental toughness is a learnable personal trait (Horsburgh, Schermer, Veselka, & Vernon, 2009; McAuley et al., 2022).

Mental toughness can be defined as the individual's power to regroup and the positive psychological capacity that can be developed in order to recover in adverse situations such as high levels of responsibility, failure, setbacks, and conflict (Bull, Shambrook, James, & Brooks, 2005). Athletes with high mental toughness are thought to be self-confident, control their behavior, recover quickly and focus on their goals (Cowden, 2017). Individuals who are determined, self-motivated, competitive, and do not lose their concentration under pressure are on the way to becoming mentally tough athletes. It is thought that athletes with high mental toughness learn to think positively in order to turn negative thoughts and emotions into positive ones and to adopt the right attitudes in the face of pressure, problems, competition, and mistakes. These athletes tend to perform better during competitions. In addition, they adapt better to the rehabilitation process for the sports injuries they encounter (Farnsworth, Marshal, & Myers, 2022).

Every individual is born with a certain amount of mental toughness, but at the same time, mental toughness can be increased with the right educational approach. As important as systematic work and repetition are to increase physical skills, psychological skills such as providing concentration, regulating arousal levels, and increasing self-confidence should also be studied systematically (Weinberg & Gould, 2015).

Considering that performance is a psychological process, another important concept that we encounter is anxiety. Anxiety is the widespread feeling of fear, which is one of the fundamental characteristics of being human. It is a state of inner distress and fear of something with no object and sometimes no cause (Dağ, 1999). The ability of athletes to make the proper choices regarding their behavior can be significantly impacted by anxiety. The athlete's ability to make the right choice and perform at a high-level decreases as their anxiety level increases. Extreme pressure might cause athletes to make poor decisions. Excessive worry can cause athletes to forget movements they are very familiar with and have practiced frequently, confuse their emotions and cause them to make unfavorable movements (Gümüş, 2002). The state of trait anxiety is the persistence of the individual's perception of the situations encountered as a threat regardless of any situation. The number of threatening sources is related to the extent and persistence of anxiety severity (Spielberger, 1985). The constant presence of anxiety in a person gives the appearance of a personality trait, and this state of continuity increases the possibility of psychological and physical disorders in the person. This appearance is also seen in people with generalized anxiety disorder. The state of constant anxiety begins to become normal for the person, and as a result, the person approaches events and situations with a restless, tense, and distressed perspective (Leahy & Holland, 2000).

In sailing sports, in addition to the struggle with the opponent, skills such as being able to read the changing weather conditions well and determine the new route in this direction, developing a strategy by predicting the maneuvers of the opponent, to decide on the points to turn well in order to finish the course in the fastest and shortest way without deviating from the main route are required. In addition to the stress of coping with all these variables, the expectations and beliefs of family, friends, clubs, coaches, and sponsors also cause more pressure on the athlete. Especially before the competition, the anxiety, stress, and mood disorders experienced by the athletes lead to the emergence of uncontrollable psychological conditions, which negatively affect the targeted performance and lead to failure. Examining the pertinent literature reveals that the research on national sailing athletes, who must deal with highly complicated variables, needs to be revised. Determining the relationship between national sailing athletes' trait anxiety levels and mental toughness levels, as well as the effects of various variables on these levels of athletes, were the goals of the research, which was carried out for these reasons.

3. Method

3.1. Participants

The research universe consists of national athletes affiliated with the sailing federation, licensed athletes in different sailing disciplines, and continuing their training to participate in at least one international competition within the next three months. The sample consists of kitesurfing, windsurfing, and centerboard athletes who voluntarily participate in the research.

3.2. Procedure

The research was carried out with the permission of the national athletes' clubs and with the athletes' approval. First of all, the aim of the research was explained to the athletes, who were informed that they could leave the research

whenever they wanted. Questionnaires were distributed to the volunteer athletes face-to-face before the training started, and they were asked to answer them. There was no time limit for the athletes to complete the questionnaires.

3.3. Data Collection Tools

In addition to the Demographic Information Form prepared by the researcher as a data collection tool in the research, the "Sports Mental Toughness Inventory" and the trait anxiety dimension of the "State-Trait Anxiety Inventory" were used.

Sports Mental Toughness Questionnaire (SMTQ): Sheard, Golby, and Van Wersch (2009) conducted the scale's validity and reliability analysis, and Altıntaş and Koruç (2016) translated the scale into Turkish. There are 14 questions on the scale, divided into three sub-dimensions. The confidence, continuity, and control Cronbach's Alpha reliability coefficients for the scale are 0.72, 0.71, and 0.66, respectively. The scale's items are listed in the following sequence, along with the contents of each sub-dimension: Being assured of one's abilities and superiority against rivals to accomplish shared objectives in trying circumstances (Items 1, 5, 6, 11, 13, 14). Control: Being at ease in unforeseen circumstances or under pressure while maintaining composure and control (Items 2, 4, 7, 9). Continuity: Assuming accountability, concentrating, and striving to achieve objectives (Items 3, 8, 10, 12).

Trait Anxiety Scale (TAS): Spielberger, Gorsuch, and Lushene (1970) created the scale, formerly known as the state-trait anxiety assessment, to assess individuals' trait anxiety. Oner and Lecompte (1985) created the scale's Turkish equivalent. It is a four-point Likert-style scale for self-evaluation. The scale's internal consistency coefficient in Turkish ranges from .83 to.87. The test-retest reliability was between .71 and.86.The construct and criterion validity were also found to be acceptable for the original and Turkish form (Oner & Lecompte, 1985). In the current study, the trait anxiety dimension of the scale was used. In the trait anxiety scale, the number of reversed items (1, 6, 7, 10, 13, 16, and 19 items) is seven, and the scores obtained from the scale range from 20 to 80. The average score level determined in the applications can vary between 36 and 41, and high scores indicate high anxiety levels.

Demographic Information Form: The demographic information form created for the research consists of 8 questions. The questions were asked in Likert type. The Demographic Information Form created for the research includes information on age, gender, education level, sailing discipline, how many years the athlete has been doing this sport, and how many years the athlete has been a competitor.

3.4. Statistical Analysis

The analysis of the data obtained from the research was made with the SPSS (Statistical Package for the Social Sciences) 22 program. Frequency and percentage analysis of demographic variables and descriptive statistics about continuous variables are included. In addition, whether there is a difference between the scale scores by gender was examined with the Mann-Whitney U analysis method, an alternative independent groups t-test parametric method. This is a non-parametric method used to compare the scores of two groups. This method was used because the sample size was not sufficient (N>25) in two groups related to gender. This method is a method that sorts the raw data and compares the mean of the rank. Kruskal Wallis analysis method, an alternative one-way analysis of variance (ANOVA) parametric method, was used to compare scale scores and sub-dimensions by sailing class. This method is non-parametric and is used to compare scores of at least three groups. This method was used because the sailing class categorical variable was not sufficient for each sample size (N>25). In cases where the Kruskal-Wallis analysis was found to be statistically significant, the groups with a significant difference were compared in pairs with the Mann-Whitney U test, and the groups with a difference were indicated in the difference column. A pairwise comparison was not made for the groups that did not show a significant difference due to the Kruskal-Wallis analysis. Finally, the relationship between the variables was examined with Pearson correlation analysis. Statistical analyzes were tested at a significance level of 0.05.

In this section, the findings related to the research problems are given.

Table 1. Frequency and percentage of demographic variables.

Variable	Group	Frequency	Percentage
Gender	Female	14	43.8
	Male	18	56.3
Education level	High school	8	25.1
	University	22	68.8
	Master	1	3.1
	Ph.D.	1	3.1
Sailing class	Centerboard	14	43.8
	Windsurfing	10	31.2
	Kitesurfing	8	25
Total		32	100

Table 1 presents that 32 national sailing athletes participates in the research. By gender, 43.8% of the participants are female, and 56.3% are male. By education level, 68.8% of the participants are in university, 25.1% are in high school, 3.1% are master, and 3.1% are Ph.D. graduates. In the sailing class, 43.8% of the participants are in the active sailing group, 31.3% in the windsurfing group, and 25% in the kitesurfing group.

4. Results

Table 2 is the descriptive statistics table showing the mean and standard deviations of the variables and the skewness and kurtosis values used in the data distribution. The skewness and kurtosis values give information about the normality of the continuous scores, and the data distribution between -2 and +2 is normal (George & Mallery, 2010). All variables show normal distribution.

Table 2. Descriptive statistics for age, duration af doing sports, duration of competing, anxiety, confidence, control and continuity

Variables	Mean	SD	Skewness	Kurtosis
Age	24.16	7.47	0.9	0.443
Duration of doing sports (Years)	8.94	4.65	1.027	0.701
Duration of competing (Years)	5.06	3.64	1.574	1.606
Anxiety	50.28	4.09	0.581	1.115
Confidence	17.50	3.35	-0.285	0.635
Control	10.47	1.68	-0.763	1.619
Continuity	9.38	1.18	-0.054	-0.637

Table 3. Mann-Whitney U test chart between trait anxiety and mental toughness scores by gender.

Scale	Gender	N	Mean	SD	Mean rank	Z	p-value
Anxiety	Female	14	50.07	2.50	16.25	-0.134	0.894
	Male	18	50.44	5.07	16.69		
Confidence	Female	14	16.00	3.44	12.57	-2.105	0.035*
	Male	18	18.67	2.85	19.56		
Control	Female	14	11.21	1.05	21.25	-2.59	0.01*
	Male	18	9.89	1.88	12.81		
Continuity	Female	14	9.14	0.95	14.68	-1.026	0.305
	Male	18	9.56	1.34	17.92		

Note: *p<.05.

The Mann-Whitney U test was used to determine the difference between trait anxiety and mental toughness scores by gender Table 3. There is no significant difference between trait anxiety scores by gender (Z=-0.134, p>.05). Trait anxiety levels of women and men are similar. A significant difference was found between the scores obtained from the sub-dimensions of mental toughness inventory, confidence (Z=-2.105, p<.05), and control (Z=-2.59, p<.05) by gender. While the mean rank of men is higher in the confidence dimension, the mean rank of women is higher in the control dimension. That is, while men's confidence level is higher than women's, women's control levels are also higher than men's. However, there is no significant difference between the continuity sub-dimension scores of the mental toughness inventory by gender (Z=--1.026, p>.05), meaning the continuity levels of men and women are similar.

Table 4. Kruskal-Wallis test table between trait anxiety and mental toughness scores by sailing class.

Scale	Sailing class	N	Mean	SD	Mean rank	Chi-square	P-value	Difference
Anxiety	Centerboard	14	50.43	3.88	16.04	0.111	0.946	None
	Windsurfing	10	50.1	2.69	17.3			
	Kitesurfing	8	50.25	6.07	16.31			
Confidence	Centerboard	14	15.86	2.98	12.07	11.346	0.003*	3 and 1
	Windsurfing	10	17.2	2.74	15.25			3 and 2
	Kitesurfing	8	20.75	2.43	25.81			.
Control	Centerboard	14	10.64	1.45	17.14	0.419	0.811	None
	Windsurfing	10	10.6	1.17	17.05			
	Kitesurfing	8	10	2.56	14.69			
Continuity	Centerboard	14	9.57	1.4	17.89	0.83	0.66	None
	Windsurfing	10	9.1	1.1	14.55			
	Kitesurfing	8	9.38	0.92	16.5			
1: Centerboard; 2: Windsurfing; 3: Kitesurfing								

Note: *p<.05.

A difference between trait anxiety and mental toughness scores by sailing class was examined by the Kruskal-Wallis analysis method. There is no significant difference between trait anxiety scores by sailing class (χ^2=-0.111, p>.05). Anxiety levels are similar by sailing class. A significant difference was obtained in the confidence sub-dimension of the mental toughness inventory by the sailing class (χ^2=-11.346, p<.05). The difference column shows between which groups there is a difference. The mean rank of the participants in the kitesurfing group was higher than the mean rank of the centerboard and windsurfing groups. The confidence levels of the athletes in the kitesurfing group are higher than the participants in the centerboard and windsurfing groups. However, there is no difference between the confidence averages of the participants in the centerboard and windsurfing groups. (Z=-0.919, p>.05). There was no statistically significant difference in the sub-dimensions of mental toughness inventory, control (χ^2=-0.419, p>.05), and continuity (χ^2=0.830, p>.05) by sailing class. The control and continuity levels of the participants are similar by sailing classes.

Table 5. Pearson's correlation between age, duration af doing sports, duration of competing, anxiety, confidence, control and continuity

Variable	1	2	3	4	5	6	7
1. Age	1						
2. Duration of doing sports (Years)	0.498**	1					
3. Duration of competing (Years)	0.368*	0.823**	1				
4. Anxiety	-0.01	0.038	-0.218	1			
5. Confidence	0.283	0.288	0.143	0.001	1		
6. Control	-0.421*	-0.074	-0.126	0.439*	-0.460**	1	
7. Continuity	0.037	0.168	0.092	0.251	0.041	-0.042	1

Note: **p<.01; *p<.05.

The relationship between continuous variables was analyzed with the Pearson correlation coefficient. This method is used when the data is continuous. In addition, for this method, the distribution of the variables must be normal. All variables are normally distributed.

A significant correlation was found between the age of the participants and the duration of doing sports (r=0.498), the duration of the competition (r=0.368), and the control sub-dimension (r=-0.421) (p<.05). While there is a positive and moderate relationship between their age and the duration of doing sports and competition, there is a negative and moderate relationship between age and control sub-dimension. There is no significant relationship between the duration of doing sports and the duration of the competition and the sub-dimensions of trait anxiety and mental toughness (p>.05). A statistically positive and moderate relationship was found between trait anxiety and confidence sub-dimension (r=0.439, p<.05)., and there was a negative and moderate relationship between confidence and control, which are sub-dimensions of mental toughness (r=-0.460, p<.05).

5. Discussion and Conclusion

When the findings obtained from the research are evaluated, it is seen that the confidence level of male athletes is higher than that of female athletes, and the level of control of female athletes is higher than male athletes Table 3.

Similarly, in the study conducted by Bahadir and Adilogullari (2020) with university student-athletes, by the gender variable in the sub-dimensions of mental toughness, a significant difference was reported in favor of women in the control sub-dimension (p<0.03) and in favor of men in the confidence sub-dimension (p<0.00). In the study by Baser (2019), there was a significant difference in favor of men in the sub-dimensions of confidence and control and total scores of the participants' sports mental toughness levels by the gender variable. Social gender-based division of labor, duties and socio-cultural values brought by the patriarchal structure is realized under the influence of social gender roles. Especially in patriarchal societies, men are raised by instilling a sense of self-confidence from childhood. On the contrary, women live under the intensity of patriarchal control in many areas, from education to business life, from family to social life. In the process, it is thought that women who are faced with many negativities and need to find quick solutions to the negativities experienced may turn into individuals with higher control over time, which may also affect their sports life.

Another result obtained from the study is that the confidence levels of the athletes in the kitesurfing group are higher than the participants in the centerboard and windsurfing group Table 4. When the literature is examined, Kristjánsdóttir, Erlingsdóttir, Sveinsson, and Saavedra (2018) found in their study on elite handball players that men were more successful than women in the sub-dimensions of trust (p<0.012) and control (p<0.001) and total scores of mental toughness, while there was no significant difference in the continuity sub-dimension. They reported minor differences by age, which may be related to sportive skill rather than experience. They also stated that men's anxiety scores were lower than women's (p=0.685). Slimani, Miarka, Briki, and Cheour (2016) examined the relationship between mental toughness and competitive success in kickboxers. They found statistically significant (p<0.001) differences in the sub-dimensions of trust, continuity, control, and total scores between the athletes who won and those who lost the competition. Turkoglu (2019), in his study on taekwondo athletes, reported no significant difference in the confidence and control sub-dimensions and total mental toughness scores by age and gender. However, there was a significant positive correlation (p<0.05) in the continuity sub-dimension of sports age. In his study with 484 young hockey players, Walker (2016) found significant differences between awareness level and confidence (p<0.05), continuity (p<0.01), control (p<0.01) sub-dimensions, and total scores of mental toughness (p<001). Schaefer, Vella, Allen, and Magee (2016) reported that participants with high scores on the mental toughness inventory had lower anxiety levels in their study on golf players. Few studies have been conducted on sailing sports, especially kitesurfing. Ceylan, Tekin, Özdağ, and Ceylan (2010), in their study on kitesurfing and windsurfing athletes, stated that kitesurfers showed a high level of assertiveness. Assertiveness is defined as self-confident behavior and a way of expressing one's thoughts, feelings, and beliefs in direct, honest, and appropriate ways to protect their rights. The most extreme branch among sailing classes is kitesurfing. It is thought that self-development in an extreme sport, being able to do risk analysis, keeping control in unexpected situations, and being able to do what others cannot do in a non-traditional and high-risk sport can increase one's sense of confidence.

Different results have been obtained in some studies examining the relationship between age and mental toughness. Zeiger and Zeiger (2018), in their study with 1245 endurance athletes aged 18 and over, examined the participants' mental toughness profiles by considering parameters such as age, gender, and sports age and reported that men, compared to women, older participants to younger participants, and higher sports age to inexperienced participants were in the higher mental toughness class. Bahadir and Adilogullari (2020) stated in their study with university student-athletes that there was no significant difference according to the branch variable. However, there was a weakly significant relationship between age and the control sub-dimension. In the study conducted by Güvendi, Can, and Işım (2020) on 95 triathlon athletes, there was a significant difference in favor of national athletes in the confidence sub-dimension of mental toughness according to the variable of being national or not (p<0.05), while no significant difference was found in the sub-dimensions of continuity and control.

In this study, in which national sailing athletes were examined, a positive and moderate relationship was obtained between the age of the participants and the duration of doing sports and competitions. At the same time, there was an unexpectedly negative and moderate relationship between the age and control sub-dimension and between confidence and control sub-dimension Table 5. Although it is thought that mental toughness will increase as age and experience increase, trust and expectations of society, family, friends, clubs and sponsors may cause stress factors on the athlete to increase. As age increases, the thought of losing against younger athletes may cause a loss of control from time to time.

In order to achieve a high level of performance in sports, it is important for athletes to develop their mental toughness skills and to control their anxiety, and the following is recommended:

- Starting sports at the appropriate age for the branch and regularly applying the training process on a scientific basis will ensure that the athletes develop healthily in technical, tactical, and physical terms and strengthen them psychologically.

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- Supporting the athletes with preparatory competitions and competitions in the basic and high-level training process will strengthen experience and confidence dimensions.
- Receiving support from sports psychologists who are experts in the field in every process of long-term athlete development by the club management will be beneficial to improve the athletes' mental toughness and control their anxiety.
- The guidance-counseling services that the athletes will receive at schools during their education and training processes will also contribute to overcoming the psychological difficulties they may encounter during their education, sports, and life.

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