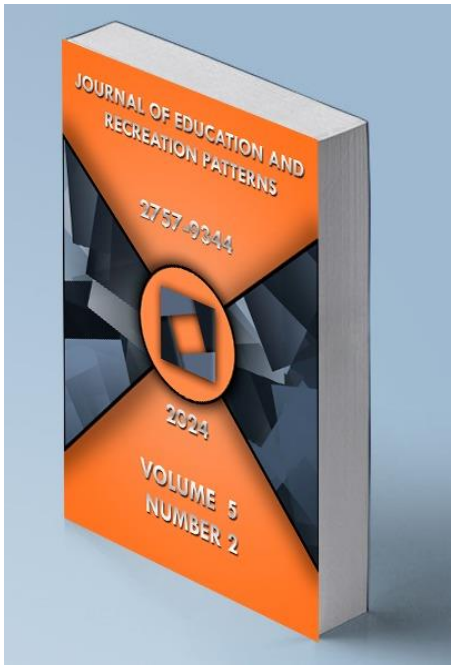

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The Role of Mental Training on Mental Toughness of Individual and Team Athletes

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ABSTRACT
This research was carried out to examine the effect of mental training applied on individuals who do individual and team sports on mental resilience. The research consists of a total of 365 athletes, 113 of who mare women (31%) and 252 of whom are men (69%), who activelyeng age in individual and team sports. During the data collection phase, the Mental Training Inventory in Sports was developed by Behnke et al (2019), validity and reliability studies were carried out by Yarayan and İlhan (2018) and adapted to Turkish, and the validity and reliability study was conducted by Sheard et al (2009). The Mental Endurance Inventory in Sports, which was adapted into Turkish by Altıntaş and Koruç (2016), was used. Pearson-Correlation analysis was used to determine the relationships between the variables included in the study in the analysis of the data, T-Test analysis method was used to determine whether there was a difference between the groups. In the research findings, it was determined that the sub-dimensions of mental training, mental basic skills and talking to yourself differed significantly according to gender. According to the international athlete variable, a significant difference was found in the mental training mental basic skills sub-dimension and mental training total score. A significant difference was found in the sub-dimensions of international athlete variable, mental toughness, trust and control. It is thought that the study has the potential to use mental skills in sports whose effectiveness has been proven and to give an idea to the athletes and coaches about the changes that occur in the athletes as a result.

Keywords: Individual Sport, Mental Toughness, Mental Training, Team Sport

INTRODUCTION

Sports, which have many definitions due to encompassing various dimensions, can be engaged in for purposes such as maintaining a healthy life style, competing and improving performance, passingleisure time, developing strong social ties, and enjoy in gone self (Kat, 2009). At the same time, it is thought to provide physiological and psychological support, influence behavior sociologically, and help maintain or improve one's motor and mental state (Özdenk, 2015).

When looking at recent achievements, performances, and records in the sports world, it becomes clear that the human body is being utilized to its physical limits. As athletes reach their physical peaks, various methods to improve performance have been explored. Among these, mental and psychological processes, which have established a significant place in sports literature, are considered crucial, alongside physical conditioning. Today, individuals involved in performance sports prepare mentally and psychologically for both training and competitions, in addition to physical training, using various methods and techniques. Indeed, studies in the field of sports psychology are rapidly continuing (Akgül et al., 2024; Arı et al., 2020; Dursun et al., 2021; Yarayan et al., 2024; Yarayan et al., 2023; Yarayan &Gulsen, 2023; Yarayan et al., 2022). The concept of mental training, which is regarded as one of the coreelements of a successful training program, refers to the intense mental visualization of a movement with out physically performing it (Hecker & Kaczor, 1988). Additionally, it is believed that mental training processes can be utilized to develop and optimize motor skills (Cocks et al., 2014).

Studies indicate that combining physical training with mental training yields the highest performance gains (Lutz et al., 2009; Unestahl, 1982; Xiong, 2012). Training plans should take in to account individual differences to appropriately balance mental and physical preparation. Mental training is not only a use ful performance enhancement tool during competitions but can also be applied during injury recovery and pre-season periods (Altıntaş & Akalan, 2008). Another psychological factor frequently employed by athletes and coaches to boost performance is mental toughness. Mental endurance, which positively affects the performance of athletes and whose importance increases day by day with the number of studies carried out, can be expressed as positive psychological support in order to recover as soon as possible and to show the real performance in the event of failure, the concept of responsibility that puts pressure on the individual and adverse events that may affect the individual negatively (Luthans 2002). Athletes often face various emotional challenges, such as stress, anxiety, and excessive excitement, which can negatively impact their performance. In both competitions and preparation periods, athletes need to maintain high levels of mental toughness to cope with these adverse emotional states (Crust, 2007; Sheard, 2012). Individuals actively involved in performance sports must maintain a certain level of mental endurance. To achieve this, they must be capable of handling emotions like success, failure, anxiety, and stress. This mental resilience enables athletes to make efforts toward achieving success while acknowledging the negative aspects that may arise (Tekkurşun& Türkeli, 2019). While physical capacity is fundamental to success in performance sports, mental factors help sustain and elevate that success.

When the studies in the literature are examined, the positive effect of mental factors on the performance of athletes has been accepted (Cocks et al. 2014, İkizler 1997, Mamassis & Doganis 2004, Neff, 2006, Weinberg & Gould 2015, Xiong 2012). While physical competence is seen as the most fundamental element for success in performance sports, mental factors are thought to help athletes make this success permanent and take it to a higher level.

In this context, the aim of this study is to examine the effects of mental training processes on the mental endurance levels of individual sengaged in individual and team sports, across different types and disciplines.

METHOD

Research Model

In this research, the "Descriptive, Relational Survey" model was used. According to Büyüköztürk (2002), descriptive statistics is defined as statistical operations performed to collect, describe and defend numerical values of a certain variable.

Research Group

The sample of the study consists of 252 men and 113 women who are actively engaged in individual and team sports in the Eastern and South eastern Anatolia regions. In this study, the random sampling method was employed. According to Metin (2015), the chosen method to represent the population is to randomly select individuals for the sample, based on chance.

Data Collection Tools

In the study, the "Mental Training Inventory in Sports" (MTIS) developed by Behnke et al. (2019), with validity and reliability studies conducted by Yarayan and İlhan (2018) and adapted intoTurkish, and the "Mental Endurance Inventory in Sports" (MIS) developed by Sheard et al. (2009), with validity and reliability studies conducted by Altıntaş and Koruç (2016) and adapted into Turkish, were used.

The Mental Training in Sports Scale consists of 5 sub-dimensions and 20 items in total, namely basic mental skills (4 items) α=0.82), mental functioning skills (6 items) (α=0.82), personal communication skills (4 items) (α=0.85), self-talk (3 items) (α=0.91), mental visualization (3 items) (α=0.82). The inventory is a 5-point Likert-type scale.

Mental Toughness Scale in Sports consists of 3 sub-dimensions and 14 items in total, namely control (4 items) (α=0.84), confidence (6 items) (α=0.79) and continuity (4 items) (α=0.51). The inventory is a 4-point Likert-type scale.

Data Analysis

In the data analysis, missing data were evaluated to check the appropriateness of the primary analysis and the assumptions. It was determined that there were no missing data. The normality assumptions were checked using the Kolmogorov-Smirnov test, and it was observed that the data did not meet the normality assumptions. However, a review of the relevant literatüre revealed that there is growing support for the notion that normality test salone are insufficient for Likert-type scales (Tabachnick&Fidell, 2013; Hair et al., 2013). The refore, skewness and kurtosis values, which are critical for assessing normality, were examined. It was concluded that the distribution was normal, based on the skewness and kurtosis values of -2,+7 as recommended by Hong et al. (2003). Pearson- Correlation analysis was used to determine the relationships between the variables included in the study in the analysis of the data, T-Test analysis method was used to determine whether there was a difference between the groups.

Ethics of the Research

Ethical approval for this research was obtained from the Siirt University Ethics Committee on 23.06.2021 (approval number 159), after which there search commenced. The application was carried out with the voluntary consent of the participants.

FINDINGS

In the findings section of the research, information regarding the findings obtained as a result of the analysis of the data obtained in line with the purpose is included.

Table 1

Frequency and Percentage Values of the Athletes Participating in the Study

	Variable	N	%
Gender	Female	113	31.0
	Male	252	69.0
	Total	365	100.0
Age	20 and below	126	34.5
	21-25	83	22.7
	26-30	77	21.1
	31-35	28	7.7
	36 andabove	51	14.0
	Total	365	100.0
Sports Type	Individual Sports	205	56.2
	Team Sports	160	43.8
	Total	365	100.0
Nationaly athlete	Yes	84	23.00
	No	281	77.00
	Total	365	100.0

Table 1 displays the frequency and percentage distribution of athletes participating in the study based on gender, age, sports type, and national athlete status. The sample comprised 365 athletes, with 31.0% identifying as female and 69.0% as male. Regarding age, 34.5% were 20 years old or younger, 22.7% were between 21-25 years, 21.1% were between 26-30 years, 7.7% were between 31-35 years, and 14.0% were 36 years or older. In terms of sports type, 56.2% engaged in individual sports while 43.8% participated in team sports. Additionally, 23.0% of the athletes were national athletes, whereas 77.0% were not.

Table 2

The Comparison of Mental Training Levels Between Male and Female Athletes

Sub-Dimension	Variable	N	M	t	df	p
Mental Basic Skills	Female	113	17,33	2,69	363	,471
	Male	252	17,11	2,64	363	
Mental Performance Skills	Female	113	23,45	3,88	363	,007*
	Male	252	24,61	3,80	363	
Interpersonal Skills	Female	113	18,25	2,36	363	,595
	Male	252	18,11	2,43	363	

Self-Talk	Female	113	12,67	2,58	363	,002**
	Male	252	11,64	3,14	363	
Mental Visualization	Female	113	12,84	2,30	363	,951
	Male	252	12,86	2,19	363	
Total	Female	113	10,77	10,77	363	,866
	Male	252	11,06	11,06	363	

Note. $p < .050$*; $p < .001$**

Table 2 presents the t-test results examining the differences in mental training levels between female and male athletes across various sub-dimensions. For Mental Basic Skills, no significant difference was found between female (M = 17.33) and male athletes (M = 17.11), $t(363) = 2.69$, $p = .471$. In contrast, significant differences emerged in Mental Performance Skills ($p = .007$) and Self-Talk ($p = .002$), with male athletes scoring higher (M = 24.61 and M = 11.64, respectively) compared to female athletes (M = 23.45 and M = 12.67, respectively). No significant differences were observed in Interpersonal Skills ($p = .595$) and Mental Visualization ($p = .951$) between genders. The overall total scores did not significantly differ between female (M = 10.77) and male athletes (M = 11.06), $t(363) = 10.77$, $p = .866$.

Table 3

T-Test Results for Mental Toughness Levels of Athletes by Gender

Sub-Dimension	Variable	N	M	t	df	p
Trust	Female	113	19,75	3,24	363	,181
	Male	252	20,21	2,98	363	
Consistency	Female	113	10,77	1,87	363	,835
	Male	252	10,73	1,64	363	
Control	Female	113	8,61	3,15	363	,087
	Male	252	9,19	2,90	363	
MTS Total Score	Female	113	41,76	5,44	363	,786
	Male	252	41,92	4,83	363	

Table 3 presents the independent samples t-test results comparing the mental toughness levels of female and male athletes across various sub-dimensions. The analysis included a total of 365 athletes (Female N = 113; Male N = 252). There was no significant difference in trust scores between female (M = 19.75) and male athletes (M = 20.21), $t(363) = 3.24$, $p = .181$. No significant difference was found in consistency scores between female (M = 10.77) and male athletes (M = 10.73), $t(363) = 1.87$, $p = .835$. Female athletes (M = 8.61) and male athletes (M = 9.19) did not differ significantly in control scores, $t(363) = 3.15$, $p = .087$. The overall mental toughness scores did not significantly differ between female (M = 41.76) and male athletes (M = 41.92), $t(363) = 5.44$, $p = .786$.

Table 4

T-Test Results for Mental Training Levels of Athletes by Type of Sport

Sub-Dimension	Variable	N	M	t	df	p
Mental Basic Skills	Individual Sports	160	17,15	2,43	363	,849
	Team Sports	205	17,20	2,82	363	
Mental Performance Skills	Individual Sports	160	24,13	3,52	363	,600
	Team Sports	205	24,35	4,11	363	
Interpersonal Skills	Individual Sports	160	18,29	2,28	363	,337
	Team Sports	205	18,04	2,51	363	
Self-Talk	Individual Sports	160	11,85	2,84	363	,556
	Team Sports	205	12,04	3,15	363	
Mental Visualization	Individual Sports	160	12,85	2,10	363	,938
	Team Sports	205	12,86	2,31	363	
Total	Individual Sports	160	84,29	10,01	363	,844
	Team Sports	205	84,52	11,67	363	

Table 4 presents the independent samples t-test results comparing the mental training levels of athletes based on the type of sport they practice (individual vs. team sports). The analysis included a total of 365 athletes (Individual Sports N = 160; Team Sports N = 205).

There was no significant difference in mental basic skills between athletes participating in individual sports (M = 17.15) and team sports (M = 17.20), t(363) = 2.43, p = .849. No significant difference was found in mental performance skills between individual sports athletes (M = 24.13) and team sports athletes (M = 24.35), t(363) = 3.52, p = .600. Athletes in individual sports (M = 18.29) and team sports (M = 18.04) did not differ significantly in interpersonal skills, t(363) = 2.28, p = .337. There was no significant difference in self-talk between athletes participating in individual sports (M = 11.85) and team sports (M = 12.04), t(363) = 2.84, p = .556. Athletes in individual sports (M = 12.85) and team sports (M = 12.86) did not show significant differences in mental visualization skills, t(363) = 2.10, p = .938. The overall mental training scores did not significantly differ between individual sports athletes (M = 84.29) and team sports athletes (M = 84.52), t(363) = 10.01, p = .844.

Table 5

T-Test Results for Mental Toughness Levels of Athletes by Type of Sport

Sub-Dimension	Variable	N	M	t	df	P
Trust	Individual Sports	160	19,99	2,88	363	,660
	Team Sports	205	20,13	3,21	363	
Consistency	Individual Sports	160	10,62	1,65	363	,217
	Team Sports	205	10,84	1,75	363	
Control	Individual Sports	160	8,93	2,91	363	,654
	Team Sports	205	9,07	3,05	363	
MTS Total Score	Individual Sports	160	41,68	4,55	363	,672
	Team Sports	205	41,91	5,36	363	

Table 5 presents the independent samples t-test results comparing the mental toughness levels of athletes based on the type of sport they practice (individual vs. team sports). The analysis included a total of 365 athletes (Individual Sports N = 160; Team Sports N = 205).

There was no significant difference in trust scores between athletes participating in individual sports (M = 19.99) and team sports (M = 20.13), t(363) = 2.88, p = .660. No significant difference was found in consistency scores between individual sports athletes (M = 10.62) and team sports athletes (M = 10.84), t(363) = 1.65, p = .217. Athletes in individual sports (M = 8.93) and team sports (M = 9.07) did not differ significantly in control scores, t(363) = 2.91, p = .654. The overall mental toughness scores did not significantly differ between individual sports athletes (M = 41.68) and team sports athletes (M = 41.91), t(363) = 4.55, p = .672.

Table 6

T-Test Results for Mental Training Levels of Participants by National Athlete Status

Sub-Dimension	Variable	N	M	t	df	p
Mental Basic Skills	Yes	84	17,79	2,69	363	,016**
	No	281	17,00	2,62	363	
Mental Performance Skills	Yes	84	24,82	4,01	363	,127
	No	281	24,08	3,80	363	
Interpersonal Skills	Yes	84	18,48	2,49	363	,151
	No	281	18,05	2,38	363	
Talking to Yourself	Yes	84	12,21	2,96	363	,383
	No	281	11,88	3,03	363	
Mental Visualization	Yes	84	13,20	2,40	363	,109
	No	281	12,75	2,16	363	
MTIS Total Score	Yes	84	86,52	11,95	363	,045*
	No	281	83,79	10,59	363	

Note. $p < .050$*; $p < .001$**

When Table 6 is examined, there is a statistically significant difference in the total scores of mental basic skills and mental training from the sub-dimensions of the Mental Training Scale according to the nationality of the participants ($p<0.05$). There is no statistically significant difference in the sub-dimensions of mental performance skills, interpersonal skills, self-talk and mental visualization ($p>0.05$). When the average scores are examined, it is seen that national athletes (M=17.79) have higher mental endurance than non-national athletes (M=17.00) in the mental basic skills sub-dimension. In the total mental training score, it was determined that the mental training levels of national athletes (M=86.52) were higher than those of non-national athletes (M=83.79).

Table 7

T-Test Results for Mental Toughness Levels of Participants by International Athlete Status

Sub-Dimension	Variable	N	M	t	df	p
Trust	Yes	84	20,67	2,71	363	,040*
	No	281	19,89	3,15	363	
Consistency	Yes	84	10,51	1,59	363	,146

	No	281	10,82	1,74	363	
Control	Yes	84	9,97	3,29	363	,001**
	No	281	8,72	2,83	363	
MTS Total Score	Yes	84	41,21	4,90	363	,213
	No	281	41,99	5,05	363	

Note. $p < .050$*; $p < .001$**

When Table 7 is examined, there is a statistically significant difference in the trust and control sub-dimensions of the Mental Toughness Scale according to the nationality status of the participants ($p<0.05$). There is no statistically significant difference in the total scores of continuities and mental endurance, which are sub-dimensions of the Mental Training Scale ($p>0.05$). When the average scores were examined, it was determined that national athletes (M=20.67) had higher mental endurance levels than non-national athletes (M=19.89) in the confidence sub-dimension. In the control sub-dimension, which showed a significant difference, it was seen that national athletes (M=9.97) had higher levels of mental toughness than non-national athletes (M=8.72).

Table 7

T-Test Results for Mental Toughness Levels of Participants by International Athlete Status

Correlation Test Results	**Mental Basic Skills**	**Mental Performance Skills**	**Interpersonal Skills**	**Talking to Yourself**	**Mental Visualization**	**MTIS Total Score**	**Trust**	**Continuity**	**Control**	**MIS Total Score**
Mental Basic Skills	—									
Mental Performance Skills	,682**	—								
Interpersonal Skills	,679**	,594**	—							
Talking to Yourself	,331**	,324**	,241**	—						
Mental Visualization	,569**	,567**	,579**	,408**	—					
MTIS Total Score	,839**	,853**	,778**	,606**	,780**	—				
Trust	,664**	,624**	,469**	,229**	,489**	,646**	—			
Continuity	,058	-,014	,003	,064	,043	,037	,142**	—		
Control	,183**	,229**	,123*	,040	,055	,174**	,085	-,387**	—	
MIS Total Score	,317**	,240**	,215**	,138**	,281**	,304**	,609**	,659**	-,676**	—

Table 8 presents the Pearson correlation coefficients among various sub-dimensions of the Mental Training Inventory (MTI) and Mental Toughness Inventory (MTIS) scores among participants. The analysis included multiple variables: Mental Basic Skills, Mental Performance Skills, Interpersonal Skills, Talking to Yourself, Mental Visualization, MTIS Total Score, Trust, Continuity, Control, and MIS Total Score.

Mental Basic Skills showed strong positive correlations with all other sub-dimensions and total scores. Notably, it had the highest correlation with MTIS Total Score (r = .839**, p < .001), indicating that higher mental basic skills are strongly associated with overall mental toughness. Mental Performance Skills were also strongly correlated with all other sub-dimensions, especially with MTIS Total Score (r = .853**, p < .001), suggesting that enhanced performance skills contribute significantly to overall mental toughness. Interpersonal Skills

demonstrated strong positive correlations with most variables, including a substantial correlation with MTIS Total Score (r = .778**, p < .001). Talking to Yourself was moderately correlated with other variables, particularly with Mental Visualization (r = .408**, p < .001) and MTIS Total Score (r = .606**, p < .001), indicating that self-talk practices are associated with both visualization skills and overall mental toughness. Mental Visualization exhibited strong positive correlations across most variables, with the highest correlation being with MTIS Total Score (r = .780**, p < .001). Trust was positively correlated with several sub-dimensions, including a strong relationship with MTIS Total Score (r = .646**, p < .001). Continuity showed minimal to no significant correlations with most variables, except for a weak positive correlation with Trust (r = .142**, p < .001). Control had weak positive correlations with most variables and a significant negative correlation with MIS Total Score (r = −.676**, p < .001), indicating that higher control is associated with lower MIS Total Scores.

MIS Total Score was positively correlated with most variables, except for a significant negative correlation with Control (r = −.676**, p < .001).

DISCUSSION & CONCLUSION

When the findings of the study are examined according to the gender variable, it is seen that there is a significant difference in the subdimensions of the mental training scale, namely mental performance skills and self-talk (p<0.05). No significant difference was found in the other sub-dimensions of the MTIS, includingbasicmentalskills, interpersonal skills, mental imagery, and the total MTIS score (p>0.05).

Inparallel with th epresent study, Cankurtaran (2020) found a significant difference in the mental performance skill ssub-dimension of the MTIS in his study on archers, and he stated that male participants achieved higher shooting scores than female participants based on their total MTIS scores. Another study in parallel with this research is the oneby Çelik and Güngör (2020), where they found a significant difference in the mental performance skills sub-dimension according to the gender variable. However, Erdoğan and Gülşen (2020) did not find a significant difference according to the gender variable in their study on university students. In contrastto the present study, Karaca and Gündüz (2021) did not find a significant difference in the sub-dimensions of mental performance skills and self-talk in their study on orienteering athletes.

No significant difference was found in the MTS sub-dimensions of trust, perseverance, control, andthe total MTS score when the gender variable was taken in to account (p>0.05).

Inline with this study, Sarı et al. (2020) did not find a significant difference in the total MTS scores according to gender in their research. Similarly, Demir and Çelebi (2019) found no significant difference in the perseverance and controlsub-dimensions of the MTS and in the total score in their study on combat athletes. Additionally, Yarayan et al. (2018) did not find a significant difference in the MTS sub-dimensions of trust, perseverance, control, or total mental toughness scores according to gender, which is consistent with this study. The studies conducted by Yalçın (2013), Gökmen (2014), Bektaş and Özben (2016), and Kalkavan et al. (2017) also support the findings of the present study. In contrast, Yazıcı (2016), in his study on basketball players, reported that female participants had higher mental toughness averages compared to males. Similarly, Masum (2014), in his study on Pakistani tennis players, found that male participants had higher mental toughness levels compared to females. Juan and Lopez (2015) stated that men had higher mental toughness than women, and similarly, Crust and Keegan (2010) found that men were mentally tougher than women.

When the above-mentioned studies and the current research are evaluated, it can be seen that various results have been obtained regarding the gender variable in different athlete groups.

There asons for this variety can be attributed to the diversity of sports branches and the differing characteristics of these sports branches.

No significant difference wasf ound in the sub-dimensions of the MTIS (Mental Training QuestionnaireforAthletes), including basic mental skills, mental performance skills, interpersonal skills, self-talk, mental imagery, or the total MTIS score, according to the type of sport practiced ($p>0.05$).

In line with the results of this study, Karaağaç and Şahan (2021) found no significant difference in any of the sub-dimensions or in the total MTIS score according to the type of sport in their research. Similarly, Altunkalem (2020), in his study on athletics athletes, found no significant differences in any of the MTIS sub-dimensionsor in the total mental toughness score, results which align with this study. Kara and Ustaoğlu Hoşver (2019) also stated that they did not find a significant difference according to the position variable in their study on volleyball players.

Vural (2021), in his study, did not find significant differences in the sub-dimensions of mental performance skills, basic mental skills, self-talk, and mental imagery according to the type of sport practiced, aligning with there sults of this study. However, he found a significant difference in the interpersonal sub-dimension, which contradicts this research. He also stated that team athletes had higher scores than individual athletes. In contrast, Güler (2015) found significant differences between mental fitness and the type of sport practiced.

No significant difference was found in thesub-dimensions of trust, perseverance, control, orthe total MTS score according to the type of sport practiced ($p>0.05$).

In line with this study, Demir and Çelebi (2019) also did not find significant differences in the sub-dimensions of trust, perseverance, or the total MTS score according to the athletes' branches. However, the significant difference found in the control sub-dimension in their study contradicts this research. In a scientific study conducted on taekwondo athletes, it was observed that the control sub-dimension of the MTS increased with the differentiation of weight categories (Aydın, 2020). In contrast to this research, Yarayan et al. (2018) found significant differences in the sub-dimensions of perseverance, control, andthe total MTS score according to the sport branch variable. However, they did not find a significant difference in the trust sub-dimension, which aligns with this research. Narimani and Ghaffari (2007) stated that team athletes had higher levels of mental toughness compared to individual athletes.

There is a statistically significant difference in the MTIS mental basic skills sub-dimension and MTIS total score according to the participants' status as national athletes ($p<0.05$). There is no statistically significant difference in the other sub-dimensions of the scale, namely mental performance skills, interpersonal skills, self-talk and mental visualization. ($p>0,05$).

Contrary to our research, Erdoğan and Gülşen (2020) found significant differences in the mental visualization and interpersonal skills sub-dimensions according to the nationality variable in their study on university students.

There is a statistically significant difference in the confidence and control sub-dimensions of the MTS according to the status of being a national athlete ($p<0.05$). There is no statistically significant difference in the continuity sub-dimension and MTS total scores ($p>0.05$).

While Sarı et al (2020) stated in their study that there was no significant change according to the nationality variable, in contradiction with our study, Güvendi et al (2018) found a significant difference in the MTS continuity sub-dimension according to the nationality variable in their study. In another study conducted on disabled athletes using the MTS, no significant difference was found according to whether they were national athletes or not, and

this indicated that they had the belief that they would not lose control in times of threat, would be determined towards the goal, and would remain calm (Şar 2021).

In their study, Wiser and Thiel (2014) stated that athletes who experienced a sense of nationality had higher levels of mental endurance than athletes who did not experience national feeling. These results indicate that athletes know that they need to be among the best in their sport in order to take part in national teams, and that being physically ready is not enough, but also mentally ready.

Recommendation

Based on these results, it can be recommended that mental processes should be included as a subject in sports science faculties and coaching courses, that the concepts of mental training and mental toughness should be up date dannually during coach certification and development seminars to streng then their place in the sports world, and that athletes in Olympic training centers should be provided with mental training to monitör their progress. It is also suggested that sports psychologists under the Ministry of Yout hand Sports should be more actively involved in integrating mental processesinto amateur sports.

REFERENCES

Akgül, A., Solmaz, S., Uzun, A., & Yarayan, Y. E. (2024). Mental toughness: The role of imagery and emotional intelligence. *The Online Journal of Recreation and Sports, 13*(3), 334–340. https://doi.org/10.22282/tojras.1465496

Altıntaş, A., & Akalan, C. (2008). Mental training and high performance. *Spormetre Beden Eğitimi ve Spor Bilimleri Dergisi, 6*(1), 39–43. https://doi.org/10.1501/Sporm_0000000131

Altıntaş, A., & Koruç, P. B. (2016). Examining psychometric properties of the Sport Mental Toughness Questionnaire-SMTQ. *Spor Bilimleri Dergisi, 27*(4), 163–171. https://doi.org/10.17644/sbd.311985

Altunkalem, S. (2020). *Investigation of the effects of mental training to mental resistance on the elite athletes* (Master's thesis, İstanbul Gelişim Üniversitesi Lisansüstü Eğitim Enstitüsü, İstanbul).

Arı, Ç., Ulun, C., Yarayan, Y. E., Dursun, M., Mutlu, T., & Üstün, Ü. D. (2020). Mindfulness, healthy life skills and life satisfaction in varsity athletes and university students. *Progress in Nutrition, 22*(2), 1–8. https://doi.org/10.23751/pn.v22i2-S.10561

Aydın, F. A. (2020). *Taekwondo'da zihinsel dayanıklılık ve kendinle konuşmanın şişmanlık hakkındaki konuşma düzeyine etkisi* (Master's thesis, Akdeniz Üniversitesi Sosyal Bilimler Enstitüsü, Antalya).

Behnke, M., Tomczak, M., Kaczmarek, L. D., Komar, M., & Gracz, J. (2019). The sport mental training questionnaire: Development and validation. *Current Psychology, 38*, 504–516. https://doi.org/10.1007/s12144-017-9629-1

Bektaş, M., & Özben, Ş. (2016). An investigation of the psychological resilience levels of married individuals in terms of some socio-demographic variables. *Celal Bayar Üniversitesi Sosyal Bilimler Dergisi, 14*(1), 216–240. https://doi.org/10.18026/cbusos.16929

Büyüköztürk, Ş. (2002). *Sosyal bilimler için veri analizi el kitabı* (1st ed., pp. 149–156). Pegem Yayıncılık.

Cankurtaran, Z. (2020). The effect of the mental training skills used by the archers in the competition environment on the ranking shot scores. *International Journal of Contemporary Educational Studies (IntJCES), 6*(1), 13–29.

Cocks, M., Moulton, C. A., Luu, S., & Cil, T. (2014). What surgeons can learn from athletes: Mental practice in sports and surgery. *Journal of Surgical Education, 71*(2), 262–269. https://doi.org/10.1016/j.jsurg.2013.07.002

Crust, L. (2007). Mental toughness in sport: A review. *International Journal of Sport and Exercise Psychology, 5*(3), 270–290. https://doi.org/10.1080/1612197X.2007.9671836

Crust, L., & Keegan, R. (2010). Mental toughness and attitudes to risk-taking. *Personality and Individual Differences, 49*(3), 164–168. https://doi.org/10.1016/j.paid.2010.03.026

Çelik, O. B., & Güngör, N. B. (2020). The effects of the mental training skills on the prediction of the sports sciences faculty students' anxiety levels. *International Journal of Eurasian Education and Culture, 9*, 888–929.

Demir, P., & Çelebi, M. (2019). Investigation of mental resistance of combat sports athletes at the Faculty of Sport Sciences. *International Journal of Contemporary Educational Studies (IntJCES), 5*(2), 188–199.

Dursun, M., Yarayan, Y. E., Arı, Ç., Ulun, C., & Adaş, S. K. (2021). COVID-19 in Turkey: Leisure boredom, psychological resilience, physical activity and emotional state. *IJERI: International Journal of Educational Research and Innovation, (15),* 460–486. https://doi.org/10.46661/ijeri.5588

Erdoğan, B. S., & Gülşen, D. B. A. (2020). Determination of mental training levels of athletes studying in the Faculty of Sport Sciences. *Mediterranean Journal of Sport Science, 3*(1), 219–228. https://doi.org/10.38021/asbid.753967

Gökmen, B. (2014). *Özel eğitim okulu yöneticilerinin psikolojik dayanıklılık ve iş doyumları arasındaki ilişkinin incelenmesi (İstanbul örneği)* (Unpublished master's thesis, İstanbul Aydın Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul).

Güler, M. Ş. (2015). *Farklı branşlarda spor yapan bireylerin mental yeteneklerinin değerlendirilmesi* (Master's thesis, Atatürk Üniversitesi Sosyal Bilimler Enstitüsü, Erzurum).

Güvendi, B., Türksoy, A., Güçlü, M., & Konter, E. (2018). Profesyonel güreşçilerin cesaret düzeyleri ve zihinsel dayanıklılıklarının incelenmesi. *International Journal of Sports Exercise & Training Sciences, 4*(2), 70–78.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long Range Planning, 46*(1-2), 1–12. http://dx.doi.org/10.1016/j.lrp.2013.01.001

Hecker, J. E., & Kaczor, L. M. (1988). Application of imagery in sport psychology. *Journal of Sport and Exercise Psychology, 10*, 363–373. http://doi.org/10.1123/jisep.10.4.363

Hong, S., Malik, M. L., & Lee, M. K. (2003). Testing configural, metric, scalar, and latent mean invariance across genders in sociotropy and autonomy using a non-Western sample. *Educational and Psychological Measurement, 63*(4), 636–654. https://doi.org/10.1177/0013164403251332

İkizler, C. (1997). *Sporda başarının psikolojisi*. Alfa Basın Yayın Dağıtım.

Juan, M. V. T., & Lopez, A. (2015). Mental toughness of scholar athletes. *Researchers World, 6*(3), 22.

Kalkavan, A., Acet, M., & Çakır, G. (2017). Investigation of the mental endurance levels of the athletes participating in the table tennis championship of universities in Turkey. *International Journal of Science Culture and Sport, 5*(4), 356–363. https://doi.org/10.14486/IntJSCS699

Kara, Ö., & Ustaoğlu Hoşver, P. (2019). Investigation of the mental training level of women volleyball players who take place in play-off competition in terms of some variables. *International Sport Science Student Studies, 1*(1), 35–42.

Karaağaç, S., & Şahan, H. (2021). Examine the relationship between optimal flow state and mental training in individual and team sports. *International Journal of Turkish Sport and Exercise Psychology, 1*(1), 30–43.

Karaca, R., & Gündüz, N. (2021). Examining the relationship between mental training and performance in orienteering athletes. *Spormetre: The Journal of Physical Education and Sport Sciences, 19*(1), 99–115. https://doi.org/10.33689/spormetre.719991

Kat, H. (2009). *The comparison of the individual sports athletes and team sports athletes?*

Skills to solve the problems and the stress levels (Unpublished master's thesis, Erciyes Üniversitesi Sağlık Bilimleri Enstitüsü, Kayseri).

Luthans, F. (2002). Positive organizational behavior: Developing and managing psychological strengths. *Academy of Management Perspectives, 16*(1), 57–72.

Lutz, A., Slagter, H. A., Rawlings, N. B., Francis, A. D., Greischar, L. L., & Davidson, R. J. (2009). Mental training enhances attentional stability: Neural and behavioral evidence. *Journal of Neuroscience, 29*, 13418–13427. https://doi.org/10.1523/JNEUROSCI.1614-09.2009

Mamassis, G., & Doganis, G. (2004). The effects of a mental training program on juniors' precompetitive anxiety, self-confidence, and tennis performance. *Journal of Applied Sport Psychology, 16*, 118–137.

Masum, R. (2014). A mixed method analysis of mental toughness in elite and sub-elite male and female Ennis players in Pakistan. *Advances in Social Sciences Research Journal, 1*(6), 110–122.

Metin, M. (Ed.). (2015). *Kuramdan uygulamaya eğitimde bilimsel araştırma yöntemleri*. Pegem Akademi.

Narimani, M., & Ghaffari, G. (2007). The comparison of aggression and mental toughness between martial athletes: Football players and non-athletes. 6th International Congress on Physical Education and Sport Sciences.

Neff, R. (2006). *Mental training for athletes and other performers*. http://www.mentaltraininginc.com

Özdenk, S. (2015). *Bireysel ve takım sporuyla uğraşan sporcular ile spor yapmayan bireylerin duygusal zeka ve liderlik özelliklerinin incelenmesi* (Doctoral dissertation, Gazi Üniversitesi Beden Eğitimi ve Spor Öğretmenliği Ana Bilim Dalı, Ankara).

Sarı, İ., Sağ, S., & Pınar Demir, A. (2020). Mental toughness in sport: An examination in Taekwondo Athletes. *Journal of Physical Education and Sport Sciences, 22*(4), 131–147.

Sheard, M. (2012). *Mental toughness: The mind set behind sporting achievement* (2nd ed.). Routledge. https://doi.org/10.4324/9780203103548

Sheard, M., Golby, J., & Wersch, A. V. (2009). Progress toward construct validation of the Sports Mental Toughness Questionnaire (SMTQ). *European Journal of Psychological Assessment, 25*(3), 186–193. https://doi.org/10.1027/1015-5759.25.3.186

Şar, M. (2021). *Sporcuların zihinsel dayanıklılık düzeyleri ile sporda mücadele ve tehdit algı düzeylerinin engelli-engelli olmayan sporcularda karşılaştırılması* (Master's thesis, Bahçeşehir Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul).

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2013). *Using multivariate statistics* (6th ed., pp. 497–516). Pearson.

Tekkurşun, D. G., & Türkeli, A. (2019). Examination of exercise addiction and mental strength levels of students of sport sciences faculty. *Journal of Sport Sciences Researches, 4*(1), 10–24. https://doi.org/10.25307/jssr.505941

Unestahl, L. E. (1982). Inner mental training: A systematic self-instructional program for self-hypnosis. *International Journal of Clinical and Experimental Hypnosis, 30*(2), 209.

Vural, C. (2021). *Bireysel ve takım sporcularının zihinsel antrenman bileşenlerinin incelenmesi* (Master's thesis, Gazi Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara).

Xiong, J. (2012). The functions and methods of mental training on competitive sports. *Physics Procedia, 33*, 2011–2014. https://doi.org/10.1016/j.phpro.2012.05.316

Yalçın, S. (2013). *İlköğretim okulu öğretmenlerinin mesleki tükenmişlik düzeyleri ile stres, psikolojik dayanıklılık ve akademik iyimserlik arasındaki ilişki* (Master's thesis, Gazi Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara).

Yarayan, Y.E, & İlhan, E.L. (2018). The Sport Mental Training Questionnaire (SMTQ) Adaptation Study. Gazi *Journal of Physical Education and SportSciences* 23(4), 205-218.

Yarayan, Y. E., & Gulsen, D. B. A. (2023). A stepwise regression analysis on the effects of imagery and emotion regulation on courage level in athletes. *Journal of ROL Sport Sciences*, 896–910.

Yarayan, Y. E., Yıldız, A. B., & Gülşen, D. B. A. (2018). Examination of mental toughness levels of individual and team sports players at elite level according to various variables. *The Journal of International Social Research, 11*(50), 992–999. http://dx.doi.org/10.17719/jisr.2018.2509

Yarayan, Y. E., Güngör, N. B., Çelik, O. B., & Gülşen, D. B. A. (2022). Path analysis: Predicting psychological performance strategies in the context of athlete identity. *Akdeniz Spor Bilimleri Dergisi, 5*(3), 699–712. https://doi.org/10.38021/asbid.1164718

Yarayan, Y. E., İlhan, E. L., Esentürk, O. K., Arı, Ç., & Gülşen, D. B. A. (2023). Does emotional intelligence affect mental toughness in physically disabled athletes? *Spor Bilimleri Araştırmaları Dergisi, 8*(2), 231–242. https://doi.org/10.25307/jssr.1228541

Yarayan, Y. E., Solmaz, S., Aslan, M., Batrakoulis, A., Al-Mhanna, S. B., & Keskin, K. (2024). Sex differences in athletic performance responses to the imagery and mental toughness of elite middle-and long-distance runners. *Sports, 12*(6), 141. https://doi.org/10.3390/sports12060141

Yazıcı, A. (2016). *Profesyonel basketbol oyuncularında zihinsel dayanıklılık ve duygusal zekanın çeşitli değişkenler açısından incelenmesi* (Unpublished master's thesis, Gazi Üniversitesi Sağlık Bilimleri Enstitüsü, Ankara).

Weinberg, S., & Gould, D. (2015). *Introduction to psychological skills training*. In *Foundations of Sport and Exercise Psychology* (pp. 247–271). Human Kinetics.

Wieser, R., & Thiel, H. (2014). A survey of mental hardiness and mental toughness in professional male football players. *Wieser and Thiel Chiropractic and Manual Therapies, 22*(17).

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