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An Exploration of The Relationship Between Mindfulness and Stress Levels of Taekwondo Athletes by Different Variables

Özlem Sinem Uslu[1], Mustafa Uslu[2*]

[1] Phd, Selcuk University, Sports Science Faculty, Department of Physical Education Teaching, Konya, Turkey.

[2] Prof.Dr.,Akdeniz University, Faculty of Education, Department of Educational Sciences, Antalya, Turkey.

***Corresponding author:** Mustafa Uslu, Prof.Dr.,Akdeniz University, Faculty of Education, Department of Educational Sciences, Antalya, Turkey, Email: mustafauslu@akdeniz.edu.tr

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ABSTRACT

This study aimed to explore the relationship between mindfulness and stress levels in taekwondo athletes in light of different variables. To this end, 532 taekwondo athletes (246 female and 286 male) were selected through convenience sampling. Data for the assessment of mindfulness were collected through the Mindfulness Inventory for Sport, developed by Thienot et al. (2014) and adapted to Turkish by Tingaz (2020). The Depression Anxiety Stress Scales, developed by Lovibond and Lovibond (1995), and adapted to Turkish by Akın and Çetin (2007), were used to assess stress. Descriptive statistics (i.e., percentages and frequencies) were used to display the distribution of the participants' background information, and skewness-kurtosis values were checked for data normality. Due to the data's non-normality, Mann-Whitney U and Kruskal-Wallis tests were utilized along with descriptive statistics. Findings indicated significant differences in the mindfulness levels of the participants by age, athletic background, category, and previous injuries. In addition, participants' stress levels differed significantly by age, athletic background, and category. Limitations of the study were discussed, and recommendations for future studies were made accordingly.

Keywords: *Taekwondo, Mindfulness, Stress*

INTRODUCTION

Having an origin in Eastern meditation culture, mindfulness is a concentration method that has recently become a widespread concept in Western cultures (Vural and Okan, 2021). While the concepts of attention and awareness relatively adhere to similar attributes of normal functioning, mindfulness might be considered a rise in focus levels in present realities (Tingaz, 2020). On its own, the concept of awareness is the powerful repetition of the feeling people experience internally in their lives. However, mindfulness refers to the state in which a person pays undivided attention to ongoing events through unconditional acknowledgment (Brown and Ryan, 2003). In other words, mindfulness is a cognitive and affective orientation to momentary situations in life (Çelik, 2019). Many athletes, voluntarily or involuntarily, come up with a series of positive or negative thoughts in their minds while focused on goals. This set of thoughts sometimes leads individuals to positive behaviors, while others result in negative ones.

In such cases, athletes activate their decision-making mechanisms to achieve more solid results in momentary situations where events develop with thoughts containing awareness. Some researchers have referred to mindfulness as psychological training to help athletes improve performance, saying that athletes can mentally raise themselves to a higher level and learn the methods and techniques for self-development through meditation. (Sipahi, 2021).

Stress

Stress is a concept that arises from negative emotions in the face of physically and psychologically threatening events (Kesler, 2020).

People can isolate themselves from the psychological factors that cause stress by doing sports (Turkay and Sökmen, 2014). Individuals activate their bodies by doing sports. Mental fatigue occurs due to the negativities experienced in today's business life and the difficulties in interpersonal communication and interactions. This mental fatigue drives people to early burnout. Since doing sports also means bodily activation, these mental fatigues are replaced by physical ones and result in the relaxation of the mind. This indicates that sports are an indispensable part of life and relieve stress.

High levels of stress have many negative effects on athletes. Stress begins when athletes do not feel comfortable mentally, namely, when they feel under pressure and tire their minds for fear of failure. Thus, they fail to deliver the expected performance in competition. Stress also causes athletes to dislike competitions, make unhealthy decisions, and avoid taking responsibility. Consequently, they face the threat of overtraining (psychological and physical reluctance) that no athlete wants to experience. Not only do athletes suffer from stress, but so do other club members (coach, manager, sporting director, and other employees) who work for the team (Özdevecioğlu and Yalçın, 2010). Given the negativities caused by stress, athletes should devote time to mental training to feel more comfortable cognitively.

The absence of any studies in the literature examining the relationship between mindfulness and stress levels in taekwondo athletes according to different variables contributes to the importance of our research.

METHOD

This study adopted the relational screening model, one of the quantitative research designs, since it aimed to examine the relationship between mindfulness and stress levels in taekwondo athletes according to gender, age, athletic background, category, and previous injuries.

Population and Sampling

The study included 532 active taekwondo athletes (246 females, 46.24%, and 286 males, 53.76%) from Antalya, Mersin, Konya, Kayseri, Aksaray, Ankara, Gaziantep, Urfa, Trabzon, Istanbul, Izmir, and Erzurum (each in a different geographical region of Turkey). The participants were determined through convenience sampling, also known as available or accidental sampling. Convenience sampling involves obtaining samples that are easily accessible for research (Özen and Gül, 2007).

Data Collection Instruments

The participant form created by the researchers, the Mindfulness Inventory for Sport (MIS), and the Stress Scale (SS) of the Depression Anxiety Stress Scales (DASS) were utilized as data collection tools in the study. The participant form contains questions about gender, age, athletic background, category, and previous injuries.

The MIS, which aims to measure the mindfulness levels of athletes, was developed by Thienot et al. (2014). Tingaz (2020) made the Turkish adaptation of the scale. The scale consists of three sub-dimensions: awareness (5 items) (α=0.81), non-judgmental attitude (5 items) (α=0.70), refocusing (5 items) (α=0.77), and a total of 15 items. The items were rated on a 6-point Likert scale (1 = not at all, 6 = very much). In addition, the scale gives a total score. The items in the Non-judgmental attitude" subdimension are

reverse coded. In this study, Cronbach's alpha internal consistency coefficient for the overall inventory was (α= 0.79).

The DASS, developed by Lovibond and Lovibond (1995) and adapted in Turkish by Akın and Çetin, was designed to evaluate the negative emotional states concerning the relevant concepts (Akın and Çetin, 2007). It is a commonly used scale for assessing mental health status. It is a 4-point Likert scale, where the items are rated as follows: never/not at all suitable for me = 0, Sometimes and occasionally/slightly appropriate for me = 1. Quite often/usually appropriate for me = 2, always/completely appropriate for me = 3. Participants respond to the scales by considering their situation from the previous week and choosing the most suitable one. The high scores obtained from the depression, anxiety, and stress subdimensions indicate that the participant has a problem in that specific area (Lovibond and Lovibond, 1995). The scales comprise 14 separate items for depression, anxiety, and stress variables (Deniz and Sümer, 2010). The 14-item SS used in this study measures difficulty relaxing, nervous arousal, easily upset or agitation, irritation or overreaction, and impatience. The range of 0–14 points within acceptable limits indicates ordinary stress (Akın and Çetin, 2007).

Data Analysis

Descriptive statistics (i.e., percentages and frequencies) were used to display the distribution of the participants' background information, and skewness-kurtosis values were checked for data normality. A quick analysis demonstrated that the data were non-parametric. In cases where the normality assumption cannot be satisfied, researchers recommend the Kruskal-Wallis test to examine the difference between more than three independent groups and the Mann-Whitney U test for two independent groups (Baştürk, 2011; Orhunbilge, 2000; Alpar, 2014, Lorcu, 2015). In this respect, these nonparametric tests were employed since the assumptions required for parametric tests were not satisfied.

FINDINGS

TABLE 1: Demographic Information of Participants

Variables		f	%
Gender	Male	286	53,8
	Female	246	46,2
	Total	532	100,0
Age	11-15	346	65,0
	16-19	115	21,6
	20-23	21	3,9
	23 and above	50	9,4
	Total	532	100,0
Athletic Background	Less than a year	107	20,1
	1-3 years	137	25,8
	4-7 years	184	34,6
	8 years and above	104	19,5
	Total	532	100,0
Category	Poomsae	58	10,9
	Competitor	322	60,5
	Poomsae + Competitor	152	28,6
	Total	532	100,0
Previous Injuries	None	292	54,9
	Minor	150	28,2
	Moderate	72	13,5
	Serious	18	3,4
	Total	532	100,0

Table 1 indicates that 53.8% of the participants were male, 65.0% were between the 11-15 age range, 34.6% had an athletic background of 4-7 years, 60.5% were in the competitor category, and 54.9% had no previous injuries.

TABLE 2: Distribution of Scalar Scores

Scale/Subdimension	Number of Items	N	M	SD	P
MIS1/AWR	5	532	2,8570	,97595	,000
MIS2/NJA	5	532	2,8808	1,05816	,000
MIS3/RF	5	532	2,9619	1,05621	,000
SS	14	532	19,6259	8,98047	,001

*AWR = awareness, NJA=Non-judgmental attitudes, and RF=Refocusing

Table 2 presents the participants' scores from the MIS subdimensions (i.e., AWR, NJA, and RF), the SS, and the significance values of the Kolmogorov-Smirnov and Shapiro-Wilk tests administered for determining data structures. Accordingly, RF had the highest mean (M=2.96) in the subdimensions of MIS, and SS had a mean of 19.62.

TABLE 3: Mann-Whitney U Test Results on the Differences in Participants' Scalar Scores by Gender

Scale/Subdimension	Variable	N	Rank M.	U	p
MIS1/AWR	Male	286	273,17	33.270,000	,280
	Female	246	258,74		
MIS2/NJA	Male	286	273,03	33.111,500	,290
	Female	246	258,91		
MIS3/RF	Male	286	273,62	33.141,500	,248
	Female	246	258,22		
SS	Male	286	272,15	33.563,000	,361
	Female	246	259,93		

Table 3 indicates no statistically significant difference in the participants' scores in the MIS subdimensions and SS ($p>0.05$).

TABLE 4: Kruskal-Wallis Test Results on the Differences between Participants' Scalar Scores by Age

Scale/Subdimension	Variable	N	Med.	H	p
MIS1/AWR	11-15	346	2,80	13,960	,003*
	16-19	115	3,20		
	20-23	21	3,00		
	23 and above	50	3,20		
MIS2/NJA	11-15	346	2,80	12,148	,007*
	16-19	115	3,20		
	20-23	21	2,80		

	23 and above	50	3,00		
MIS3/RF	11-15	346	2,80	26,315	,000*
	16-19	115	3,40		
	20-23	21	3,60		
	23 and above	50	3,30		
SS	11-15	346	18,00	12,976	,005*
	16-19	115	22,00		
	20-23	21	21,00		
	23 and above	50	18,50		

The Kruskal-Wallis test results presented in Table 4 suggested significant differences in the participants' scores in the MIS subdimensions and SS by age. The first significant difference was in MIS1/AWR (H (3) =13,960; p=.003). Paired comparisons revealed that the difference was between the 11-15 and 16-19 age groups, with the scores of the second (M=3.20) significantly higher than those of the first (M=2.80) (p<0,05). The second significant difference was in the MIS2/NJA (H (3) =12,148; p=.007). Paired comparisons suggested that the difference was between the same age groups as in the previous subdimension, with the scores of the 16-19 age group (M=3.20) significantly higher than those of the 11-15 (M=2.80) (p<0,05). The third significant difference was in the MIS3/RF (H (3) =26,315; p=.000). Paired comparisons indicated that the difference was between the same age groups (i.e., 11-15 and 16-19), with the scores of the second group (M=3.40) significantly higher than those of the first one (M=2.80) (p<0,05). Participants' scores in the SS also differed significantly by age (H (3) =12,967; p=.005). Paired comparisons demonstrated the presence of the difference in the same age groups as previous ones, with the scores of the 16-19 age group (M=22) significantly higher than those of the 11-15 (M=18) (p<0,05).

TABLE 5: Kruskal-Wallis Test Results on the Participants' Scalar Scores by Athletic Background

Scale/Subdimension	Variable	N	Med.	H	p
MIS1/AWR	Less than a year	107	2,80	9,997	,019*
	1-3 years	137	2,80		
	4-7 years	184	2,80		
	8 years and above	104	3,20		
MIS2/NJA	Less than a year	107	2,60	3,677	,299
	1-3 years	137	3,00		
	4-7 years	184	2,80		
	8 years and above	104	3,00		
MIS3/RF	Less than a year	107	2,30	8,808	,032*
	1-3 years	137	3,00		
	4-7 years	184	3,20		
	8 years and above	104	3,20		
SS	Less than a year	107	17,00	12,013	,007*
	1-3 years	137	20,00		
	4-7 years	184	21,00		
	8 years and above	104	19,00		

The Kruskal-Wallis test results presented in Table 5 suggested a statistically significant difference between the participant's scores in the MIS1/AWR, MIS3/RF (H (3) =9,997; p=.019), and the SS (H (3) =12,013; p=.007). Paired comparisons suggested that the difference was in the "less than a year" and "8 years and above" groups, with the scores of the first group (M=2.80) significantly lower than those of the second (M=3.20) (p<0,05). The difference in the MIS3/RF was also in the same groups, with the scores of the prior (M=2.30) significantly lower than the latter (M=3.20) (p<0,05). The difference in participants' scores in the SS differed significantly in the "less than a year" and "4-7" groups, with the scores of the first (M=17.00) significantly lower than those of the second (M=21.00) (p<0,05).

TABLE 6: Kruskal-Wallis Test Results on the Participants' Scalar Scores by Category

Scale/Subdimension	Variable	N	Med.	H	p
MIS1/AWR	Poomsae	58	2,60	2,606	,272
	Competitor	322	2,80		
	Poomsae + Competitor	152	2,80		
MIS2/NJA	Poomsae	58	2,60	2,031	,362
	Competitor	322	3,00		
	Poomsae + Competitor	152	3,00		
MIS3/RF	Poomsae	58	2,40	9,940	,007
	Competitor	322	3,20		
	Poomsae + Competitor	152	3,00		
SS	Poomsae	58	14,00	10,547	,005
	Competitor	322	20,00		
	Poomsae + Competitor	152	20,00		

As indicated in Table 6, significant differences were available in the participants' scores in MIS3/RF (H (3) =9,9940; p=.007) and SS (H (3) =10,547; p=.005) by category. Paired comparisons revealed that the differences in the MIS3/RF were in the Poomsae and Poomsae + Competitor categories, with the scores of the first category (M=2.40) significantly lower than those of the second (M=3.00) (p<0,05). The second difference was in the Poomsae + Competitor category, wherein the scores of the first one (M=2.40) were significantly lower than those of the second (M=3.20) (p<0,05). Participants' scores in the SS also differed significantly in the Poomsae and Competitor categories, with the scores of the first (M=14.00) significantly lower than those of the second (M=20.00) (p<0,05). Significant differences were also observed in the Poomsae and Poomsae + Competitor groups, with the scores of the prior (M=14.00) significantly lower than those of the latter (M=20.00) (p<0,05).

TABLE 7: Kruskal-Wallis Test Results on the Participants' Scalar Scores by Previous Injuries

Scale/Subdimension	Variables	N	Med.	H	p
MIS1/AWR	None	292	2,60	26,038	,000*
	Minor	150	3,00		
	Moderate	72	3,20		
	Serious	18	3,20		

MIS2/NJA	None	292	2,60	11,978	,007*
	Minor	150	3,00		
	Moderate	72	3,00		
	Serious	18	3,30		
MIS3/RF	None	292	2,80	20,058	,000*
	Minor	150	3,20		
	Moderate	72	3,40		
	Serious	18	3,40		
SS	None	292	18,00	10,648	,140
	Minor	150	21,00		
	Moderate	72	20,50		
	Serious	18	24,00		

The Kruskal-Wallis test results in Table 7 suggested that the participants' scores in the MIS1/AWR (H (3) =26,038; p=.000), MIS2/NJA (H (3) =11,978; p=.007), and MIS3/RF (H (3) =20,058; p=.000) differed significantly by previous injuries. Paired comparisons revealed that the difference in the MIS1/AWR was in the None and Minor groups, with the scores of the first (M=2.60) significantly lower than those of the second (M=3.00) (p<0,05). The difference in the MIS2/NJA was in the None and Moderate groups, with the scores of the first (M=3.00) significantly higher than those of the second (M=2.60) (p<0,05). The last significant difference was in the None and Minor groups in participants' scores in the MIS3/RF, with the scores of the prior group (M=2.80) significantly lower than those of the latter (M=2.80) (p<0,05). In addition, a significant difference was observed in the None and Moderate groups in the MIS3/RF, with the scores of the first group (M=3.40) significantly higher than those of the second (M=2.80).

TABLE 8: Spearman Correlation Test Result on the Relationship Between Scales and Subdimensions

Correlation Test Results	MIS1/AWR	MIS2/NJA	MIS3/RF	SS
MIS1/AWR				
MIS2/NJA	,615**			
MIS3/RF	,619**	663**		
SS	,316**	,348**	,408**	
* significance level 0.01 ** significance level 0.05				

Table 8 presents the results of the Spearman correlation test conducted to determine the relationship between the participants' scores from the scales and subdimensions. Table 8 included the results of only statistically significant (p<0.05 or p<0.01) cases and excluded the insignificant ones (p>0.05). Cohen's (1988) rating system was referred to interpret the correlation coefficient (r), which shows the strength and direction of the relationship. The r values in this system are categorized as follows: 0–0.09 (no), 0.10–0.29 (low), 0.30– 0.49 (moderate), and 0.50–1 (high) correlation. The correlation coefficient (r) indicates the direction of the relationship. Hence, a negative r value indicates a negative (nonlinear) relationship, and a positive r value indicates a

positive (linear) relationship. Accordingly, there were significantly highly positive linear relationships between MIS1/AWR and MIS2/NJA (r =, 615; p =, 000) and MIS1/AWR and MIS3/RF (r =, 619; p =, 000). The strongest correlation among the variables examined was between the SS and the MIS3/RF (r =.408; p =.000), which was at a moderate level and positive.

DISCUSSION AND CONCLUSION

Participants' scores in the MIS subdimensions and SS did not differ significantly by gender (p>0.05). However, Vural and Okan (2021) found that in their research on a shooting branch, refocusing and total scores differed significantly by gender. Vural and Okan (2021) also found positive low-level relationships and statistical significance between athletes' mindfulness levels, RF, and total scores. Tingaz (2020) stated that there was no significant difference between gender and mindfulness levels among the students of the Faculty of Sports Sciences. However, in his research with elite wrestlers, Kesler (2020) found a statistically significant difference between gender and the mindfulness levels of athletes. Similar results were reported by Çelik (2019), who conducted a study with mountaineering athletes. Supporting findings were also reported by Kozak et al. (2021). Bulğay et al. (2020) found a significant difference between gender and the MIS1/AWR scores of track and field athletes. Arslan (2018) concluded that females had higher mindfulness levels than males.

Participants' scores in the MIS subdimensions (AWR, NJA, and RF) and SS differed significantly by age. Paired comparisons revealed that the difference in the MIS1/AWR was in the 11–15 and 16–19 age groups, with the scores of the latter significantly higher than those of the prior (p<0,05). The difference in the MIS2/NJA was also between the same age groups, with the scores of the second group significantly higher than those of the first (p<0,05). The significant difference in the third MIS subdimension (refocusing) was again between the 11–15 and 16–19 age groups, with the scores of the second group significantly higher than the first (p<0,05). Participants' scores in the SS differed significantly in the 11–15 and 16–19 age groups, with the scores of the latter significantly higher than the first (p<0,05). Çelik (2019) found a significant difference between age and mindfulness levels in his research with mountaineering athletes. Arslan (2018) concluded that individuals' mindfulness levels increased as their age increased and their perceived stress levels decreased. In his research with elite wrestlers, Kesler (2020) discovered no statistically significant relationship between athletes' age and mindfulness levels.

Significant differences were also observed in participants' scores in the MIS subdimensions (AWR and RF) and SS according to their athletic backgrounds. Paired comparisons showed that the difference in the MIS1/AWR was in the "less than a year" and "8 years and above" groups, with the scores of the first group significantly lower than those of the second (p<0,05). The difference in the MIS3/RF was in the same groups, with the scores of the first group significantly lower than those of the second (p<0,05). Participants' scores in the SS differed significantly in the "less than a year" and "4–7 years" groups, with the scores of the prior group significantly lower than those of the latter (p<0,05). In his study with the students of the Faculty of Sports Sciences, Tingaz (2020) discovered no significant difference between athletic background and mindfulness levels. Similar results were reported in the study conducted by Kozak et al. (2021).

There were also significant differences in participants' scores in the MIS3, RF, and SS by category. Paired comparisons suggested that the difference in the MIS3/RF was in the Poomsae and Poomsae + Competitor categories, with the scores of the first significantly lower than those of the second (p<0,05). Also, participants' scores in the MIS3/RF and SS differed significantly in the Poomsae and Competitor categories, with the scores of the first category significantly lower than those of the second (p<0,05). Additionally, significant differences were found in the Poomsae and Poomsae + Competitor categories, with the scores of the first category being significantly lower than those of the latter.

Previous injuries had a significant impact on participants' scores in the MIS subdimensions. Paired comparisons revealed that the difference in the MIS1/AWR was in the None and Minor groups, with the scores of the first group significantly lower than those of the second ($p<0,05$). The difference in the MIS2/NJA stemmed from the None and Moderate groups, with the scores of the second group significantly higher than those of the first ($p<0,05$). The significant difference in the MIS3/RF originated from the None and Minor groups, with the scores of the former significantly lower than those of the latter ($p<0,05$). Additionally, participants' scores in the MIS3/RF differed significantly in the None and Moderate groups, with the scores of the second group significantly higher than those of the first.

There were highly positive linear relationships between the MIS1/AWR, MIS2/NJA, and MIS1-MIS3 subdimensions. The SS-MIS3/RF had the strongest correlation of the examined variables. Arslan (2018) determined that as individuals' mindfulness levels increased, their perceived stress levels decreased. In another study, Chiesa and Serretti (2009) concluded that perceived stress decreased as mindfulness increased. Similar findings were also reported in the study conducted by Grossman et al. (2004).

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