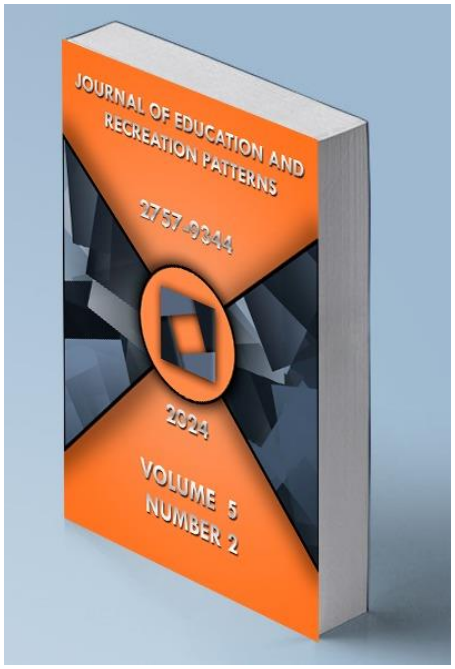


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**İsmail KOÇ[1], Cengizhan PAKYARDIM[2]**

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[1] Kırşehir Ahi Evran University Faculty of Sport Sciences, ismail.koc@ahievran.edu.tr, https://orcid.org/0000-0002-1047-7959

[2] Kahramanmaraş Sütçü İmam University, Faculty of Sport Sciences, cengizhanpakyardim@hotmail.com, https://orcid.org/0000-0001-6126-8164

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# Relationship Between the Mental Toughness, Self-Efficacy and Decision Making in Wrestling Referees

**İsmail Koç[1], Cengizhan Pakyardım[2]**

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**ABSTRACT**
The aim of this study is to examine the relationship between mental toughness, self-efficacy and decision making in wrestling referees. The research is a descriptive and relational design research conducted with survey method. The sample group of the study consisted of a total of 130 wrestling referees, 109 of whom were male and 21 of whom were female, with an average age of 36.22±10.05, who were actively working in the Turkish Wrestling Federation. The data in the study were obtained by using Sports Mental Toughness Questionnaire-SMTQ, Melbourne Decision-Making Inventory-II (MDMSI-II) and Referee Self-Efficacy Scale (REFS). The datas were analyzed using t test and ANOVA test and Pearson correlation analysis from parametric test methods. As a result of the research, it was found that there were positive significant relationships between SMTQ and REFS, positive significant relationships between SMTQ and careful decision-making among the sub-dimensions of MDMSI, negative significant relationships between REFS and careful decision-making style among the sub-dimensions of MDMSI, positive significant relationships between Buck-passing decision-making style, procrastinatory decision-making style and Hypervigilance decision-making style. It was found that there was a significant positive relationship between the refereeing year variable and the total scores of the SMTQ, a positive relationship between the game knowledge sub-dimension of the REFS sub-dimensions, and a negative relationship between all sub-dimensions of the MDMSI. According to the refereeing category variable, it was determined that there was no statistically significant difference in the overall averages of SMTQ and REFS, while there was a statistically significant difference in MDMSI; Buck-passing, Procrastination and Hypervigilance decision-making styles. This study can reveal which strategies can be applied to improve referees' decision-making processes or to improve their training programmes.

**Keywords:** Decision Making, Mental Toughness, Self-Efficacy, Wrestling Referees

## INTRODUCTION

The completion of sports competitions according to specific rules and impartial decisions is undoubtedly closely linked to the referees, who are responsible for the correct management of the matches in all aspects. In this sense, referees, whose duty it is to manage the competition within the existing rules with accurate, quick and effective decisions, are considered one of the most critical determinants of individual or team success (Guillén & Feltz, 2011; Kırtepe & Çetinkaya, 2018). Referees have some challenging criteria for making fair and impartial decisions (Aktaş et al., 2011). In order for referees to successfully navigate the challenging criteria inherent to their role and conclude competitions in accordance with the established rules and based on objective decisions, it is essential that they possess not only domain-specific knowledge, physical fitness, and competence, but also sufficient psychological preparedness (Dönmez & Özgül, 2020; Ekmekci et al., 2011). Indeed, research demonstrates that in sporting contexts, psychological factors are as significant as physical capacity in achieving high performance (Crust, 2008; Jones et al., 2007; Liew et al., 2019; Sheard, 2012). One of the most crucial competencies is mental toughness (Gould et al., 2002). Although different conceptualizations of mental toughness have been proposed (Clough et al., 2002), there is a general consensus that it is a multidimensional construct (Hardy et al., 2014). In this context, the various proposed constructs have resulted in disparate definitions of the concept of mental toughness. Some researchers define mental toughness as an individual's belief in their ability to succeed, the determination, decision-making, and perseverance despite challenges and setbacks, the ability to exert control over actions and outcomes, and the capability to manage cognitive and emotional experiences (Coulter et al., 2016; Guillén & Laborde, 2014; Jones et al., 2007). Sheard and colleagues (2009) adopted a positive psychology perspective in their investigation of mental toughness, introducing a novel approach. This approach posits that mentally resilient athletes tend to approach and respond to challenges and adversities in a manner that is adaptive (through control, confidence, and perseverance), thereby facilitating positive outcomes.

The concept of self-efficacy refers to an individual's belief in their capacity to successfully complete a specific situation or task, taking into account the demands of the given context. This belief has been demonstrated to influence a range of individual behaviors, including motivation, cognitive processes and emotional responses (Bandura, 1977, 1986). This concept is viewed as one of the most significant psychological factors influencing individual performance. The conceptual model of referee self-efficacy, as proposed by Guillén and Feltz (2011), was developed with the objective of understanding the self-efficacy beliefs of sports referees in their decision-making processes and the manner in which these beliefs are shaped. This model examines the relationship between referees' self-confidence and a range of external factors. The evidence suggests that referees with high self-efficacy are more accurate in their decisions, more effective in their performance, more committed to their profession, more respected by coaches, administrators and other organizations, and experience less stress than referees with low self-efficacy. The aforementioned information suggests that referees who possess high levels of mental toughness and self-confidence, and who are confronted with challenging and stressful circumstances during and following the competition, will demonstrate a reduced incidence of errors and exhibit greater stability and consistency in their decision-making processes. It is therefore crucial for referees to possess the requisite mental toughness and self-efficacy in order to perform at the optimal level throughout the competition. In the context of competitive wrestling, the responsibility of the referee is to make prompt and accurate decisions in order to manage the competition between the two athletes. Therefore, wrestling referees must have a number of qualities such as knowledge of the game, fitness, mental toughness, self-confidence, determination, attention to detail and quick but firm reactions.

Wrestling is a complex sport that requires not only physical abilities but also strategic thinking and instant decision-making skills. In this context, wrestling referees play a critical role in maintaining a fair and organized competition. The ability of referees to make correct decisions under high pressure is directly related to the influence of psychological factors such as mental toughness and self-efficacy. Although existing research provides some findings on the psychological factors of sport referees, there is limited information on this subject, especially in the context of wrestling referees. Most of the studies focus more on the technical and theoretical aspects of referees' decision-making processes and do not focus enough on important variables such as psychological resilience. This situation suggests that the psychological factors affecting the performance of wrestling referees should be analyzed in more depth. Mental toughness describes the ability of athletes and referees to cope with stressful situations, while self-efficacy refers to individuals' belief in their own abilities. These two factors can significantly influence referees' decision-making processes and thus the course of the match. For example, being able to make quick and correct decisions under pressure is a reflection of a referee's mental toughness. At the same time, referees' self-confidence allows them to make more effective decisions at critical moments.

The aim of the study is to investigate the relationship between mental toughness, self-efficacy, and decision-making styles among wrestling referees affiliated with the Turkish Wrestling Federation. Furthermore, the study will examine the relationship between these variables and other factors. Furthermore, the study aims to provide recommendations for practitioners in the field based on the findings obtained.

## METHOD

### Research Model

The study was conducted using a survey method and was designed in a descriptive and correlational pattern (Büyüköztürk et al., 2015).

### Universe and Sample

The universe of research consists of 1909 active wrestling referees from the Turkish Wrestling Federation. The sample group consists of 130 volunteer wrestling referees, selected through random sampling from the population in question. For the power analysis, a= 0,05, sampling error was taken as +0,03 (Yazıcıoğlu & Erdoğan, 2004) and the number of people to be sampled was calculated as 130 people. The referees have completed the Sport Mental Toughness Inventory (SMTQ), the Referee Self-Efficacy Scale (REFS), and the Melbourne Decision-Making Styles Inventory II (MDMSI-II) in a precise and accurate manner, without any errors. The sample includes referees aged between 19 and 61 years (mean age = 36.22 ± 10.05) and with refereeing experience ranging from 1 to 38 years (mean experience = 12.32 ± 8.92). Of the sample, 83.8% (n=109) were male and 16.2% (n=21) were female, 55.4% (72) had an undergraduate degree, while 45.4% (59) were national referees, 88.5% (115) were actively involved in sports in the branch they had previously refereed. Demographic information pertaining to the research group is presented in Table 1.

**Table 1**

*Demographic Information of the Referees in the Research Group*

| Gender | | | Education | | | Referee Category | | | Athlete Status | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | | N | % | | N | % | | N | % |
| Male | 109 | 83.8 | High School | 11 | 8.5 | Candidate | 11 | 8.5 | Yes | 115 | 88.5 |
| Female | 21 | 16.2 | Associate Degree | 6 | 4.6 | Provincial | 33 | 25.4 | No | 15 | 11.5 |
| | | | Licence | 72 | 55.4 | National | 59 | 45.4 | | | |
| | | | Master's Degree | 41 | 31.5 | International | 27 | 20.8 | | | |
| Total | | | | | | | | | | 130 | 100 |

## Data Collection Tools

The research was approved by the Ethics Committee for Scientific Research and Publication of Kırşehir Ahi Evran University (Decision No. 2023/01/21, dated 02.02.2023). The data collection instruments used in the research include the Sport Mental Toughness Questionnaire (SMTQ), the Referee Self-Efficacy Scale (REFS), the Melbourne Decision-Making Styles Inventory II (MDMSI-II) and data obtained from a personal information form.

***Personal İnformation Form:*** The personal information form prepared by the researchers consists of questions designed to determine the demographic characteristics of the participating wrestling referees, including age, gender, educational status, sports history in wrestling, refereeing category, and refereeing backgrounds.

***Sports Mental Toughness Questionnaire (SMTQ):*** The questionnaire developed by Sheard et al. (2009) was adapted into Turkish by Altıntaş and Bayar Koruç (2016). The scale consists of 14 items and 3 subdimensions: confidence, constancy and control. It is answered using a 4-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). Items 2, 4, 7, 8, 9 and 10 are reverse scored. The reliability of the scale was tested in the study by Altıntaş and Bayar Koruç (2016) and the Cronbach's alpha values for the subdimensions of the inventory were found to be: confidence: 0.84; constancy: 0.51; control; 0.79.

***Referee Self-Efficacy Scale (REFS):*** The scale was developed by Myers et al. (2012). It was adapted into Turkish by Karaçam and Pulur (2017) with the addition of a physical competence subdimensions, and validity and reliability studies were conducted. The scale consists of five subdimensions: physical competence, knowledge of the game, decision making, pressure and communication. There are no reverse-scored items in the scale. Higher scores on the subdimensions indicate higher self-efficacy (Karaçam & Pulur, 2017). The reported reliability coefficients (Cronbach's Alpha) are as follows Physical competence: 0.88; game knowledge: 0.71; decision making: 0.85; pressure: 0.88; communication: 0.81; Overall REFS: 0.90

**Melbourne Decision-Making Styles Inventory II (MDMSI-II):** The scale, developed by Mann et al. (1997) and adapted into Turkish by Deniz (2004) with validity and reliability studies. The scale consists of 22 items and four subdimensions: Vigilance decision-making style, Buck-passing decision-making style, Procrastination decision-making style, and Hypervigilance decision-making style. There are no reverse-scored items in the scale. Responses are scored as follows: "true" = 2 points, "sometimes true" = 1 point, and "not true" = 0 points. Higher scores indicate greater use of each decision style. The Cronbach's alpha coefficients for the adapted scale are Vigilance decision making: 0.80; Buck-passing decision making: 0.78; Procrastination decision making: 0.65; Hypervigilance decision making: 0.71.

The study re-evaluated the reliability of the inventories and scales. The Cronbach's alpha values for internal consistency were as follows: Sport Mental Toughness Questionnaire (SMTQ): Confidence: 0.81; Consistency: 0.65; Control: 0.75; Total SMTQ: 0.83. Referee Self-Efficacy Scale (REFS) Physical Efficiency: 0.88; Pressure: 0.91; Decision-Making: 0.76; Knowledge of the Game: 0.84; Communication: 0.87 and total REFS: 0.94. Melbourne Decision Making Styles Scale (MDMSI-II) Cautious decision making style: 0.71; Buck-passing Decision Making Style: 0.73; Procrastinator Decision Making Style: 0.73; Hypervigilance decision making style: 0.72 and MDMSI-II total: 0.85.

The results indicate that the Sport Mental Toughness Questionnaire (SMTQ), the Referee Self-Efficacy Scale (REFS) and the Melbourne Decision-Making Styles Inventory II (MDMSI-II) are reliable measurement tools (Kalaycı, 2010). Data were collected from participants both in person and online at the gymnasiums where the Turkish Wrestling Championships were held as part of the 2023-2024 activity programme of the Turkish Wrestling Federation. During the

data collection phase, the content and purpose of the research were explained to the volunteers and their consent to participate was obtained.

Among the scales used in the study, Referee Self-Efficacy Scale is a free scale for referees. However, mental toughness and decision-making scales are not scales specific to referees. The development of scales specific to wrestling referees will both increase the validity and reliability of the research and will be an important step towards improving the performance of referees. This may allow the results of the research to be used more effectively in both academic and practical fields.

### Analysis of the Data

The data were analysed using percentage (%), frequency (f), standard deviation (±), mean ($\bar{x}$) and inferential (correlation (r), one-way analysis of variance (ANOVA). In addition, the Scheffe test was used to determine the parameters of the significant difference that emerged as a result of the one-way ANOVA. Data were tested at a significance level of $\alpha$=.05.

## FINDINGS

The results of the research group are presented in the tables below, together with the necessary explanations.

**Table 2**

*Findings on the Normality Distribution of Scales and Sub-Dimensions*

| Scales | N | Median | Mod | Minimum | Maximum | $\bar{x}$ | Ss.(±) | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|
| **Confidence** | 130 | 3.33 | 3.00 | 1.67 | 4.00 | 3.29 | 0.47 | -0.674 | 0.912 |
| **Constancy** | 130 | 3.50 | 3.00 | 1.75 | 4.00 | 3.39 | 0.48 | -0.446 | -0.304 |
| **Control** | 130 | 2.75 | 3.00 | 1.00 | 4.00 | 2.63 | 0.72 | -0.104 | -0.281 |
| **SMTQ Total** | 130 | 3.14 | 3.21 | 2.07 | 4.00 | 3.13 | 0.43 | 0.094 | -0.586 |
| **Physical Competence** | 130 | 4.80 | 5.00 | 3.20 | 5.00 | 4.63 | 0.45 | -0.93 | -0.214 |
| **Pressure** | 130 | 5.00 | 5.00 | 3.00 | 5.00 | 4.63 | 0.53 | -1.141 | 0.356 |
| **Decision Making** | 130 | 4.67 | 5.00 | 3.67 | 5.00 | 4.55 | 0.45 | -0.325 | -1.464 |
| **Game Knowledge** | 130 | 5.00 | 5.00 | 3.67 | 5.00 | 4.74 | 0.39 | -1.269 | 0.114 |
| **Communication** | 130 | 4.75 | 5.00 | 3.00 | 5.00 | 4.55 | 0.47 | -0.644 | -0.449 |
| **REFS Total** | 130 | 4.67 | 5.00 | 3.56 | 5.00 | 4.61 | 0.36 | -0.744 | -0.336 |
| **Vigilance** | 130 | 1.67 | 1.83 | 0.33 | 2.00 | 1.55 | 0.41 | -1.317 | 1.125 |
| **Buck-passing** | 130 | 0.33 | 0.17 | 0.00 | 1.67 | 0.43 | 0.39 | 1.176 | 1.219 |
| **Procrastination** | 130 | 0.20 | 0.00 | 0.00 | 1.60 | 0.38 | 0.42 | 1.11 | 0.684 |
| **Hypervigilance** | 130 | 0.20 | 0.00 | 0.00 | 1.80 | 0.36 | 0.40 | 1.343 | 1.393 |
| **MDMSI-II Total** | 130 | 0.57 | 0.53 | 0.10 | 1.71 | 0.67 | 0.29 | 1.068 | 1.643 |

From Table 2 it can be seen that the means, modes and medians of the Sport Mental Toughness Questionnaire (SMTQ), the Referee Self-Efficacy Scale (REFS), the Melbourne Decision-Making Styles Inventory II (MDMSI-II) and their sub-dimensions are close to each other. The skewness values range from -1.317 to 1.343 and the kurtosis values from -1.464 to 1.643. According to Kalaycı (2010), a normal distribution is symmetric with the same arithmetic mean, mode and median. The data from the study also show that the mean, mode and median are close to each other. Additionally, while there are varying ranges for skewness and kurtosis values in the literature, skewness-kurtosis values between +2.0 and -2.0 are generally considered acceptable for normal distribution (George & Mallery, 2019). The skewness and kurtosis values in this study fall within these ranges. Based on these findings, the research data exhibit a normal distribution.

**Table 3**

*Correlation Analysis Results Showing the Relationships Between SMTQ, REFS, and MDMSI-II*

| Scales | | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| [1]SMTQ | r | .432*** | .315*** | -.278** | -.220* | -.327*** |
| [2]REFS | r | - | .303*** | -.369*** | -.288*** | -.312*** |
| [3]Vigilance | r | | - | -0.023 | 0.086 | 0.047 |
| [4]Buck-passing | r | | | - | .618*** | .711*** |
| [5]Procrastination | r | | | | - | .665*** |

Note: *p< 0.05, **p< 0.01, ***p< 0.001, [1]SMTQ, [2]REFS, [3]Vigilance Decision-Making Style, [4]Buck-passing Decision-Making Style, [5]Procrastination Decision-Making Style, [6]Hypervigilance Decision-Making Style

When examining Table 3, the following relationships are observed: There is a significant positive relationship between the total SMTQ and the total REFS (r = 0.432; p <0.05). A positive significant relationship is found between the total SMTQ and the Vigilance Decision-Making sub-dimension of the MDMSI-II (r = 0.315; p <0.05). Negative significant relationships are found between the total SMTQ and the Buck-passing Decision-Making (r = -0.278; p < 0.05), Procrastination Decision-Making (r = -0.220; p < 0.05) and Hypervigilance Decision-Making (r = -0.327; p < 0.05) sub-dimensions of the MDMSI-II. A positive significant relationship is found between total REFS and the Vigilance Decision-Making sub-dimension of the MDMSI-II (r = 0.303; p <0.05). Negative significant relationships are found between total REFS and the Buck-passing Decision-Making (r = -0.369; p < 0.05), Procrastination Decision-Making (r = -0.288; p < 0.05) and Hypervigilance Decision-Making (r = -0.312; p < 0.05) sub-dimensions of the MDMSI-II.

**Table 4**

*Correlation analysis results (refereeing backgrounds, SMTQ, REFS, MDMSI)*

| Variables | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [1]Refereeing Backgrounds(year) | r | .216* | 0.099 | .220* | 0.102 | 0.131 | 0.135 | .182* | 0.045 | -.192* | -.224** | -.229** | -.229** |
| [2]Confidence | r | - | .608*** | .172* | .198* | .225** | .392*** | .182* | .377*** | 0.118 | -.195* | -0.158 | -.191* |
| [3]Constancy | r | | - | .546*** | .355*** | .312*** | .398*** | .357*** | .401*** | .393*** | -.232** | -.200* | -.275** |
| [4]Control | r | | | - | 0.108 | .225* | .230** | .189* | .179* | .282*** | -.207* | -0.146 | -.279*** |
| [5]Physical Competence | r | | | | - | .451*** | .404*** | .634*** | .374*** | .264** | -.299*** | -.199* | -.177* |
| [6]Pressure | r | | | | | - | .482*** | .567*** | .459*** | 0.152 | -.295*** | -.204* | -.286*** |
| [7]Decision Making | r | | | | | | - | .444*** | .599*** | .293*** | -.250** | -.187* | -.248** |
| [8]Game Knowledge | r | | | | | | | - | .394*** | .234** | -.396*** | -.346*** | -.326*** |
| [9]Communication | r | | | | | | | | - | .265** | -0.166 | -.200* | -.224* |
| [10]Vigilance | r | | | | | | | | | - | -0.023 | 0.086 | 0.047 |
| [11]Buck-passing | r | | | | | | | | | | - | .618*** | .711*** |
| [12]Procrastination | r | | | | | | | | | | | - | .665*** |
| [13]Hypervigilance | r | | | | | | | | | | | | - |

Note: *p< 0.05, **p< 0.01, ***p< 0.001, [1] Refereeing Backgrounds(year), [2]Confidence, [3]Contancy, [4]Control, [5]Physical Competence, [6]Pressure, [7]Decision Making, [8]Game Knowledge, [9]Communication, [10]Vigilance, [11]Buck-passing, [12]Procrastination, [13]Hypervigilance

Looking at Table 4, positive significant relationships are found between refereeing backgrounds and the Confidence (r = 0.216; p < 0.05) and Control (r = 0.608; p < 0.05) subdimensions of the Sport Mental Toughness Questionnaire (SMTQ), as well as with the Game Knowledge subdimension (r = 0. 182; p < 0.05) of the Referee Self-Efficacy Scale (REFS), whereas no significant relationships were observed with the constancy (r = 0.099; p > 0.05), physical competence (r = 0.102; p > 0.05), pressure (r = 0.131; p > 0.05), decision making (r = 0.135; p > 0.05) and communication (r = 0.045; p > 0.05) subdimensions; in addition, negative significant relationships are found between refereeing backgrounds and Vigilance decision making (r = -0.192; p < 0.05), Buck-passing Decision-Making (r = -0.224; p < 0.05),

Procrastination Decision-Making (r = -0.229; p < 0.05) and Hypervigilance Decision-Making (r = -0.229; p < 0.05) styles of the MDMSI.

**Tablo 5**

*One-Way ANOVA Results for SMTQ, REFS, and MDMSI Sub-Dimensions by Refereeing Category*

| Sub-Dimension | | Sum of Squares | Mean Squares | F | p | Difference |
|---|---|---|---|---|---|---|
| Confidence | Between Groups | 0.943 | 0.314 | 1.444 | 0.233 | - |
| | Within Groups | 27.420 | 0.218 | | | |
| | Total | 28.363 | | | | |
| Constancy | Between Groups | 0.259 | 0.086 | 0.375 | 0.771 | - |
| | Within Groups | 28.999 | 0.230 | | | |
| | Total | 29.258 | | | | |
| Control | Between Groups | 1.549 | 0.516 | 0.998 | 0.396 | - |
| | Within Groups | 65.220 | 0.518 | | | |
| | Total | 66.769 | | | | |
| Physical competence | Between Groups | 0.339 | 0.113 | 0.561 | 0.641 | - |
| | Within Groups | 25.352 | 0.201 | | | |
| | Total | 25.691 | | | | |
| Pressure | Between Groups | 0.843 | 0.281 | 1.009 | 0.391 | - |
| | Within Groups | 35.076 | 0.278 | | | |
| | Total | 35.919 | | | | |
| Decision making | Between Groups | 1.160 | 0.387 | 1.985 | 0.120 | - |
| | Within Groups | 24.548 | 0.195 | | | |
| | Total | 25.708 | | | | |
| Game knowledge | Between Groups | 0.488 | 0.163 | 1.057 | 0.370 | - |
| | Within Groups | 19.409 | 0.154 | | | |
| | Total | 19.897 | | | | |
| Communication | Between Groups | 0.238 | 0.079 | 0.347 | 0.791 | - |
| | Within Groups | 28.735 | 0.228 | | | |
| | Total | 28.973 | | | | |
| Vigilance | Between Groups | 0.699 | 0.233 | 1.394 | 0.248 | - |
| | Within Groups | 21.070 | 0.167 | | | |
| | Total | 21.769 | | | | |
| Buck-passing | Between Groups | 2.380 | 0.793 | 5.882 | 0.001* | 3<1,2 |
| | Within Groups | 16.992 | 0.135 | | | |
| | Total | 19.372 | | | | |
| Procrastination | Between Groups | 2.212 | 0.737 | 4.631 | 0.004* | 3,4<1 |
| | Within Groups | 20.063 | 0.159 | | | |
| | Total | 22.276 | | | | |
| Hypervigilance | Between Groups | 3.343 | 1.114 | 8.115 | 0.001* | 3,4<1 |
| | Within Groups | 17.304 | 0.137 | | | |
| | Total | 20.648 | | | | |

*p<0.05, [1]Candidate Referee, [2]Provincial Referee, [3]National Referee, [4]International Referee

Looking at Table 5, it can be seen that there are no statistically significant differences in the mean scores of the Sport Mental Toughness Questionnaire (SMTQ) subdimensions Confidence (F = 1.444; p > 0.05), Constancy (F = 0.375; p > 0.05) and Control (F = 0.998; p > 0. 05), as well as in the Referee Self-Efficacy Scale (REFS) subdimensions Physical Competence (F = 0.561; p > 0.05), Pressure (F = 1.009; p > 0.05), Decision Making (F = 1.985; p > 0.05), Game knowledge (F = 1.057; p > 0.05) and Communication (F = 0.347; p > 0.05) based on the referee category variable.

Based on the referee category variable, there are statistically significant differences in the mean scores of the Referee Self-Efficacy Scale (REFS) subdimensions Buck-passing Decision-Making Style ($F = 5.882$; $p < 0.05$), Procrastination Decision-Making Style ($F = 4.631$; $p < 0.05$) and Hypervigilance Decision-Making Style ($F = 8.115$; $p < 0.05$), whereas no significant differences are found for the Vigilance Decision-Making Style ($F = 1.394$; $p > 0.05$).

To determine which groups showed significant differences on the Melbourne Decision-Making Styles Inventory II (MDMSI-II) sub-dimensions, Scheffe's test revealed the following significant differences: for the Buck-passing Decision-Making Style ($\bar{x}_{candidate} = 0.76$; $\bar{x}_{provincial} = 0.55$; $\bar{x}_{national} = 0.32$), the differences were found between national referees and both candidate and provincial referees; for the Procrastination decision-making style ($\bar{x}_{candidate} = 0.73$; $\bar{x}_{national} = 0.31$; $\bar{x}_{international} = 0.28$) and Hypervigilance decision making style ($\bar{x}_{candidate} = 0.82$; $\bar{x}_{national} = 0.27$; $\bar{x}_{international} = 0.26$), differences were found between international and national referees compared to candidate referees. This indicates that national referees have lower scores in the Buck-passing decision-making style compared to candidate and provincial referees, and international and national referees have lower scores in the Procrastination and Hypervigilance decision-making styles compared to candidate referees.

## DISCUSSION

The purpose of this study is to examine the relationship between mental toughness, self-efficacy levels and decision-making styles among wrestling referees. This section discusses the findings related to the relationships between participants' mental toughness, self-efficacy levels, and decision-making styles, as well as the variables of refereeing backgrounds and referee classification, in the context of the existing literature.

The findings of the study indicated a significant positive relationship between Sports Mental Toughness Questionnaire and Referee Self-Efficacy Scales. Specifically, the research demonstrated a positive correlation between the levels of mental toughness and refereeing self-efficacy among the wrestling referees who participated in the study. These findings are supported by various studies conducted across different disciplines in the literature, which have also demonstrated a positive correlation between mental toughness and self-efficacy among participants (Brace, 2020; Cowden, 2016; Ghazarians, 2012; Gucciardi et al., 2015; Koçyiğit, 2022; Middleton et al., 2004; Thom et al., 2020; Yıldız, 2022). Mental toughness in sports is defined as the capacity to maintain unwavering determination and belief while pursuing a goal in the face of stress, pressure, and the various challenges encountered in sports environments. This concept inherently includes the construct of self-efficacy, which is defined as the belief in one's ability to effectively manage expected situations. There is a strong and positive correlation between mental toughness and self-efficacy (Ghazarians, 2012; Middleton et al., 2004). Furthermore, the literature suggests that mental toughness and the perception of self-efficacy are concepts that are closely associated with performance and success in sports (Koç et al., 2022; Yıldız, 2022). The inclusion of the concepts of mental toughness and self-efficacy under the 'person' factor in social cognitive theory provides evidence for this relationship. Both concepts encompass personal characteristics that involve beliefs in one's ability to succeed as long as one remains physically active in daily life (Ghazarians, 2012). The positive relationship between mental toughness and self-efficacy is often highlighted in the literature, and this finding is supported in the present study. The process of achieving professionalism in refereeing involves gaining more experience, both physically and mentally. The situations encountered during this process provide referees with opportunities to develop their mental toughness and self-efficacy. Based on this relationship, it is assumed that a positive relationship between mental toughness and self-efficacy will develop in referees.

The study found a significant positive relationship between the Mental Toughness Questionnaire (SMTQ) and the Vigilance Decision-Making subscale of the Decision-Making Styles Inventaroy (MDMSI), while there was a significant negative relationship between the SMTQ and the Buck-passing, Procrastination, and Hypervigilance Decision-Making styles. Thus, as the mental toughness of the wrestling referees in the study increases, their tendency to make Vigilance decisions increases, while their tendency to make Buck-passing, Procrastination and Hypervigilance decisions decreases. This may be because more mentally controlled referees, who have higher levels of concentration and self-confidence, are less likely to adopt Buck-passing, Procrastination or Hypervigilance decision-making styles. The positive relationship between the SMTQ and a Vigilance decision-making style is thought to be due to the fact that referees with high levels of mental toughness and confidence in their own decisions are more Vigilance with certain decisions in order to avoid making mistakes. It is considered extremely important for referees to be both mentally resilient and physically competent when officiating matches. This is because referees' physical and mental capacities have a significant impact on the decisions they make, which in turn have a major influence on the outcome of the match. In line with the findings of the current study, Selvi (2018) found that mental toughness was associated with decision-making styles in a study conducted on football referees. Güvendi et al (2020) found that athletes who believe they are better than their competitors and have confidence in their athletic abilities make more Vigilance decisions and exhibit greater self-confidence. Conversely, athletes with less confidence in their abilities tend to Hypervigilance, procrastinate or avoid in their decision-making processes.

The study found a significant positive relationship between self-efficacy and the Vigilance decision making style, while there were significant negative relationships between self-efficacy and the Buck-passing, Procrastination and Hypervigilance decision making styles. Accordingly, as the level of self-efficacy of the wrestling referees in the study increases, their tendency towards Vigilance decision making increases, while their tendency towards Buck-passing, Procrastination and Hypervigilance decision making styles decreases. This finding suggests that the level of self-efficacy influences the decision-making process of referees. An individual with underdeveloped self-efficacy tends to avoid any problem they encounter (Bandura, 1995). Individuals with low self-efficacy may tend to avoid facing challenges beyond their current situation. In contrast, under conditions of high self-efficacy, individuals are reported to adopt a more courageous attitude when analysing situations and to engage more robustly in challenges (Yıldırım & Kocaekşi, 2020). Similarly, it is likely that referees with low self-efficacy may Hypervigilance and make incorrect decisions under challenging match conditions, resulting in ineffective decision-making and negatively influencing the outcome. They may avoid making critical decisions out of fear or hesitation. On the other hand, referees with high self-efficacy are expected to be more courageous and perform at a high level in the decision-making process under all match conditions. In addition, referees with high self-efficacy are trusted by athletes, coaches and spectators in match management. The literature supports these findings and is consistent with the research (Baştuğ et al., 2016; Kılıç & Öner, 2019; Sarıdede, 2018). For example, a study of basketball referees found that as referees' self-efficacy increased, their decision-making confidence and tendency to make Vigilance decisions increased, while their tendency to make sceptical and Hypervigilanceky decisions decreased (Kılıç & Öner, 2019). In the study conducted by Çağın et al. (2024), the relationship between self-efficacy and decision-making styles of wrestling referees was investigated. According to the research findings, there is a significant positive relationship between referees' self-efficacy scores and their Vigilance decision making scores, while there is a significant negative relationship between self-efficacy scores and their Procrastination and Hypervigilance decision making scores. The results of this study are consistent with and support the findings of the current research, given the similarity in the sample group and dependent variables.

The study found a significant positive relationship between the refereeing backgrounds and total scores on the Mental Toughness Questionnaire (SMTQ). This suggests that as the refereeing backgrounds (years) increases, so does the level of mental toughness. The number of years officiating reflects the level of refereeing backgrounds. Professional referees continuously develop and gain experience by progressing through different levels. Referees, who are faced with a variety of challenges in this process, also need to develop mentally. Marchant et al. (2009) emphasise that it is important to recognise that mental toughness can increase with experience. A review of the literature reveals that a study conducted by Miçooğulları et al. (2017) examined the level of mental toughness among football referees. The study revealed a notable difference in mental toughness among referees in accordance with their refereeing backgrounds. In particular, referees with a minimum of 14 years of experience exhibited elevated levels of mental toughness in comparison to those with 0–5 and 6–10 years of experience. This finding lends support to existing research indicating a positive relationship between experience and mental toughness in refereeing.

The study revealed a statistically significant positive relationship between refereeing experience and the "Game Knowledge" sub-dimension of the Referee Self-Efficacy Scale (REFS). This indicates that as the quantity of professional experience in refereeing increases, so does the level of self-efficacy experienced by referees. It is hypothesised that the accumulation of professional experience and an enhanced understanding of the interconnections between the techniques, tactics and rules of the game will positively influence referees' self-efficacy. The results of the study are thought to stem from the strong relationship between professional experience in refereeing and game knowledge, which enhances self-efficacy. Additionally, increasing game knowledge with greater professional experience may also contribute to the development of referees' self-efficacy. It is noted that experience is a fundamental factor influencing self-efficacy perceptions, with individuals who have more experience and knowledge typically exhibiting higher levels of self-efficacy (Akkoyunlu & Kurbanoğlu, 2003). In the relevant literature, the study titled "Examining the Self-Efficacy Levels of Wrestling Referees" revealed that referees with 1-5 years of professional experience exhibited lower levels of self-efficacy and game knowledge self-efficacy than those with 6-10 years and 11 or more years of refereeing experience (Arı & Erdem, 2022). Similarly, in a different study, it was found that referees with 1-5 years of professional experience had lower levels of self-efficacy and game knowledge self-efficacy than those with 6-10 years and 16 or more years of refereeing experience (Sarıdede, 2018). Karaçam and Pulur (2017) revealed a significant positive difference between referees of football, basketball, and handball in terms of their game knowledge, decision-making abilities, ability to handle pressure, communication skills, total scores, and refereeing backgrounds. As a result of a study conducted by López Aguilar et al. (2021) on Spanish referees, it was found that referees in the national category with 8 or more years of experience had higher levels of self-efficacy. Other studies reviewed in the literature have also identified a positive relationship between refereeing backgrounds and referee self-efficacy (Dereceli et al., 2019; Diotaiuti et al., 2017; Guillén & Feltz, 2011; Nazarudin et al., 2014). These findings support the results of the current research.

As a result of the research, a significant negative correlation was found between the refereeing backgrounds and all sub-dimensions of MDMSI. Accordingly, as refereeing experience increases, the tendency towards Vigilance, Buck-passing, procrastination, and Hypervigilance decision-making styles decreases. As refereeing experience increases, it is believed that correct and effective decision-making behavior develops, and there is a move away from Buck-passing, procrastination, or Hypervigilance decision-making styles. This can be considered a positive development observed with increased refereeing experience. More precisely, a tendency towards Buck-passing, procrastination, or Hypervigilance decision-making styles may arise due to a lack of experience. However, the research findings indicate a negative relationship between refereeing experience and Vigilance decision-making. In other

words, as refereeing experience increases, the tendency towards Vigilance decision-making decreases. This situation is thought to stem from the fact that as the years of experience among the wrestling referees participating in the study increase, they prefer to rely on their experience rather than obtaining the necessary information or seeking alternatives during the decision-making process. As a result, it appears that they may overlook Vigilance decision-making and proceed with their decisions without careful consideration. This finding highlights the necessity for greater attention and emphasis on Vigilance decision-making as refereeing experience increases. In the literature, it is noted that as volleyball referees gain more experience, there is a positive development in their decision-making processes (Arslan, 2022; Sarıdede, 2018). Similarly, a positive development is observed in the decision-making process of football referees as their refereeing experience increases (Aksu, 2016; Baydemir, 2023; Göksel et al., 2016). In a study conducted by Çağın et al. (2024) on wrestling referees, it was found that referees with less than 10 years of experience had a higher tendency towards Hypervigilance, Buck-passing, and procrastination decision-making styles. Conversely, referees with more than 15 years of experience exhibited less inclination towards these decision-making styles. These findings support the results of the current research.

The study found that when examining the total mean scores of SMTQ (Sport Mental Toughness Questionnaire) and REFS (Referee Self-Efficacy Scale) based on refereeing categories, no statistically significant differences were observed. This suggests that referees in different categories within the research group have similar levels of mental toughness and referee self-efficacy. However, literature reviews reveal studies that have found significant differences in mental toughness and self-efficacy levels based on refereeing categories, contrary to the results of this research (Çağın et al., 2024; Ekmekçi & Miçooğulları, 2017; Sarıdede, 2018). For example, a study conducted by Çağın et al. (2024) on wrestling referees found that referees in the international category had higher levels of self-efficacy. The observed discrepancy between the current research results and those reported in the literature is thought to be due to differences in participants' experience levels and personal characteristics.

The research results revealed that there are statistically significant differences in MDMSI (Multiple Decision-Making Styles Inventory) among refereeing categories in terms of Buck-passing, procrastination, and Hypervigilance decision-making styles, while no significant differences were found in the Vigilance decision-making style subdimension. Specifically, it was determined that candidate and provincial referees prefer the Buck-passing decision-making style more than national referees, and that candidate referees favor procrastination and Hypervigilance decision-making styles more than national and international referees. These findings suggest that refereeing category is an effective factor in the decision-making process among referees. It is thought that the Buck-passing, procrastination, and Hypervigilance attitudes observed in lower categories are due to less match experience and professional inexperience. According to the literature, a study conducted by Sarıdede (2018) found that candidate and provincial referees have a higher tendency towards Buck-passing decision-making compared to national and international referees. Additionally, candidate referees exhibit a higher level of Hypervigilance decision-making compared to provincial, national, and international referees. In a study conducted by Çağın et al. (2024) on wrestling referees, referees in the national and international categories were included in the research, while candidate and provincial referees were not included. The study found that national referees had higher mean scores for Hypervigilance, procrastination, and Buck-passing decision-making styles. Accordingly, it was concluded that national referees preferred Hypervigilance, procrastination, and Buck-passing decision-making styles more than international referees. No significant differences were observed in the Vigilance decision-making style based on refereeing category. These findings, which indicate that refereeing category influences the decision-making process, support the results of the current research.

In this study, examining the self-efficacy and mental toughness levels of wrestling referees in decision-making processes provided important findings on referee performance. The data obtained emphasise the influence of psychological factors on the decision-making abilities of referees and contribute to the literature in this field. Existing research generally focuses on technical and theoretical aspects; therefore, the effect of psychological factors is not sufficiently analysed. This study fills the existing knowledge gap by clearly demonstrating the role of psychological factors on the decision-making processes of wrestling referees. The findings show that self-efficacy and mental resilience have critical importance in improving the performance of referees. It is understood that referees' belief in their own abilities in decision-making processes and their capacity to cope with stressful situations can directly affect the course of the match. This has important practical implications for sport organisations and referee training programmes. In particular, taking these psychological factors into account in the development of training curricula may contribute to the professional development of referees. In light of these findings, future research should provide more information on how referees can improve their performance through psychological training and support programmes. For example, stress management techniques to increase mental resilience or decision-making skills workshops that enhance self-efficacy may be among the strategies that could be implemented to improve referees' performance. Furthermore, this study has some limitations. The sample size and selection used may limit the generalisability of the findings. The use of a larger and more diverse sample structure in future studies will allow the findings to be evaluated in a broader context. In particular, conducting similar studies on referees in different sport branches may develop a more comprehensive understanding of how psychological factors affect referee performance in general. In conclusion, this research has taken an important step forward in examining the psychological factors of wrestling referees and has provided information for psychological training interventions aimed at improving referee performance. The findings have both theoretical and practical implications and provide valuable contributions to the sport psychology literature.

## Conclusion

The study found a significant positive relationship between SMTQ and REFS. This indicates that there is a positive relationship between the mental toughness levels and referee self-efficacy of the wrestling referees participating in the study.

A significant negative relationship was found between SMTQ and the sub-dimensions of MDMSI, namely Vigilance, Buck-passing, procrastination, and Hypervigilance decision-making styles. This suggests that as mental toughness increases among wrestling referees, the tendency towards Vigilance decision-making increases while the tendencies towards Buck-passing, procrastination, and Hypervigilance decision-making styles decrease.

A positive significant relationship was found between REFS and the Vigilance decision-making style sub-dimension of MDMSI, while negative significant relationships were observed with the Buck-passing, procrastination, and Hypervigilance decision-making styles. This indicates that as the self-efficacy level of wrestling referees increases, the tendency towards Vigilance decision-making increases, and the tendency towards Buck-passing, procrastination, and Hypervigilance decision-making styles decreases.

A positive significant relationship was observed between refereeing backgrounds and SMTQ total scores. This suggests that as the duration of refereeing experience increases, there is a positive development in mental toughness levels.

A positive and statistically significant relationship was found between refereeing backgrounds and the Game Knowledge sub-dimension of REFS. This indicates that professional experience in refereeing leads to an increase in referee self-efficacy as experience grows.

A negative significant relationship was identified between refereeing backgrounds and all sub-dimensions of MDMSI. This implies that as refereeing experience increases, the tendency towards Vigilance, Buck-passing, procrastination, and Hypervigilance decision-making styles decreases.

When examining the general mean scores of SMTQ and REFS based on refereeing categories, no statistically significant differences were found. This suggests that referees in different categories within the research group have similar levels of mental toughness and self-efficacy.

Regarding MDMSI, there were statistically significant differences in Buck-passing, procrastination, and Hypervigilance decision-making styles based on refereeing categories, while no significant differences were observed in the Vigilance decision-making style sub-dimension. It was determined that candidate and provincial referees prefer the Buck-passing decision-making style more compared to national referees, and candidate referees prefer procrastination and Hypervigilance decision-making styles more compared to national and international referees.

In this study, examining the self-efficacy and mental toughness levels of wrestling referees in decision-making processes revealed important psychological factors affecting referee performance. The findings show that the difficulties faced by wrestling referees are directly related to their self-efficacy perceptions and mental toughness. This situation both contributes to the academic literature and provides important clues for the development of practical applications.

• Targeted Training Programmes: Training programmes specifically designed for wrestling referees should be developed. These programmes should include strategies to increase mental resilience (e.g. stress management techniques, mental imaging) and practices to improve self-efficacy (e.g. decision-making simulations).

• Mentoring and Ongoing Support: More experienced referees should be encouraged to mentor and work with new referees. This can increase new referees' sense of self-efficacy and provide better support in their decision-making process.

• Evaluation and Feedback Mechanisms: Regular feedback mechanisms should be established to evaluate the performance of arbitrators. In particular, forums and discussion groups where referees can share their difficulties in decision-making processes can improve their mental resilience.

• Mental Training Workshops: Referees should be encouraged to regularly attend mental training workshops to increase their mental resilience and self-efficacy. These workshops could focus on developing decision-making skills under pressure.

• Confidence Building Programmes: In order to increase the perception of self-efficacy, activities and studies should be organised to reinforce referees' feelings of self-confidence. In particular, sharing past successes and experiences can increase referees' belief in themselves.

**Recommendation**

Based on the findings of the study, the following recommendations for practitioners and researchers can be proposed:

- It is suggested that wrestling federations increase activities and training aimed at enhancing referees' self-efficacy, as this is considered crucial for referee performance.
- Various regulations and improvements should be made, starting from training and extending to fieldwork, to enhance referees' professional self-efficacy. Environments should be created to allow referees to develop themselves, and equal opportunities should be provided in assignments.

- A performance tracking and guidance system should be established to provide performance-based direction and assignments. This can help referees improve their self-efficacy, which in turn can enhance their decision-making skills and mental toughness.
- Successful referees should be rewarded both financially and morally. Coaches should support referees in their successful performances and avoid unjust criticism, as maintaining mental toughness is crucial for referees during stressful and high-pressure matches.
- Seminars should emphasize how referees can address issues encountered both on and off the field. Training programs should include lessons on mental toughness, self-efficacy development, and effective decision-making.
- It is recommended to conduct broader research on factors affecting the tendency towards Hypervigilance, procrastination, or Buck-passing decision-making styles in referees.
- Improving referees' communication skills to maintain positive relationships with coaches, athletes, and officials can be effective in making fair and accurate decisions during matches.
- Referees who demonstrate high mental toughness, self-efficacy, and make appropriate and effective decisions are likely to gain greater trust from coaches, athletes, and spectators.
- Referees should undergo regular physical and psychological testing to maintain their performance levels.
- Various social and cultural events should be organized to help wrestling referees relieve stress and get rid of fatigue in busy competition schedules. In this way, the morale and motivation of wrestling referees can be increased.
- Areas designated for referees in playing fields should be improved. Fatigue can negatively impact referees' performance, so providing rest opportunities is crucial, especially in tournaments with many matches.
- This study investigated the relationships between mental toughness, self-efficacy, and decision-making levels of wrestling referees, and evaluated differences based on refereeing years and categories. Future research could explore additional variables affecting mental toughness, self-efficacy, and decision-making processes, and assess the mediating roles of these variables.
- Research can be conducted to test mental training methods aimed at enhancing mental toughness and self-efficacy in referees.

## Limitations

The results of the research are limited to wrestling referees. Therefore, the results obtained can only be generalized within this framework. Addressing the relationship between mental toughness, referee self-efficacy and decision making on referees of other branches may contribute to the validity and generalizability of the findings.

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### *Author(s)' statements on ethics and conflict of interest*

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