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Determining the Levels of Mental Resilience and Imagery in National Team Athletes with Hearing Impairments

İşitme Engelli Milli Takım Sporcularının Zihinsel Dayanıklılık ve İmgeleme Düzeylerinin Belirlenmesi

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Abstract

National athletes with hearing impairments often face unique challenges that may impact their mental resilience and performance. Understanding the relationship between the levels of imagery and mental resilience in this population is critical for developing effective support strategies. The purpose of this study is to examine the relationship between the levels of imagery and mental resilience in national athletes with hearing impairments. A total of 54 professional athletes participated voluntarily in the research. After identifying outlier data through Box plot analysis, data from 2 participants were excluded, resulting in a final sample of 52 participants. Sociodemographic information was collected using a personal information form developed by the researcher. Measurement tools included the "Sport Imagery Questionnaire" and the "Sport Mental Resilience Inventory." Normality of the score distribution was confirmed through skewness and kurtosis analysis. Descriptive statistics (frequency and percentage) were employed in accordance with these findings. For data analysis, the "Independent Sample T-Test" was utilized for comparisons between two independent groups, while the "One-Way ANOVA" was used for comparisons involving more than two groups. The "Pearson Correlation Test" examined the relationship between two numerical variables. The study found that as the average scores from the mental resilience scale increased, levels of imagery in sports, scores from the sports imagery inventory, levels of motivational specific imagery, and levels of motivational general mastery also increased. This suggests a positive interaction between studies on imagery and mental resilience.

***Keywords**: Imagery, mental resilience, professional athlete, hearing ımpaired*

Öz

İşitme engelli milli sporcular genellikle zihinsel dayanıklılıklarını ve performanslarını etkileyebilecek çok fazla zorluklarla karşılaşılaşmaktadır. Bu popülasyonda imgeleme ve zihinsel dayanıklılık düzeyleri arasındaki ilişkiyi anlamak, etkili destek stratejileri geliştirmek için kritik öneme sahiptir. Bu çalışmanın amacı, işitme engelli milli sporcuların imgeleme düzeyleri ile zihinsel dayanıklılıkları arasındaki ilişkiyi incelemektir. Araştırmaya toplam 54 profesyonel sporcu gönüllü olarak katılmıştır. Kutu grafiği analizi ile aykırı veriler belirlendikten sonra, 2 katılımcının verileri çıkarılmış ve nihai örneklem 52 katılımcıdan oluşmuştur. Sosyodemografik bilgiler araştırmacı tarafından geliştirilen bir kişisel bilgi formu kullanılarak toplanmıştır. Ölçüm araçları arasında "Spor İmgeleme Anketi" ve "Spor Zihinsel Dayanıklılık Envanteri" yer almıştır. Puan dağılımının normalliği çarpıklık ve basıklık analizleri ile teyit edilmiştir. Bu bulgular doğrultusunda tanımlayıcı istatistikler (frekans ve yüzde) kullanılmıştır. Veri analizi için, iki bağımsız grup arasındaki karşılaştırmalarda "Bağımsız Örneklem T-Testi", ikiden fazla grubu içeren karşılaştırmalarda ise "Tek Yönlü ANOVA" kullanılmıştır. "Pearson Korelasyon Testi" iki sayısal değişken arasındaki ilişkiyi incelemiştir. Çalışmada, zihinsel dayanıklılık ölçeğinden alınan ortalama puanlar arttıkça, sporda imgeleme düzeylerinin, spor imgeleme envanterinden alınan puanların, motivasyona özel imgeleme düzeylerinin ve motivasyona genel hakimiyet düzeylerinin de arttığı bulunmuştur. Bu durum, imgeleme ve zihinsel dayanıklılık çalışmaları arasında olumlu bir etkileşim olduğunu göstermektedir.

***Anahtar Kelimeler**: İmgeleme, zihinsel dayanıklılık, profesyonel sporcu, işitme engelli*

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1. INTRODUCTION

In the dynamic and high-risk world of competitive sports, the combination of psychological resilience and cognitive readiness is increasingly regarded as critical for athletic success. Among the most studied psychological constructs are mental resilience, defined as an individual's ability to remain focused and perform under pressure (Clough et al., 2002), and imagery, which encompasses the broad range of cognitive processes involved in visualizing performance, strategic thinking, and emotional regulation.

Mental resilience is typically characterized by qualities such as confidence, commitment, focus, and the ability to bounce back from setbacks (Cowden, 2018). Recent studies have shown that mental resilience can significantly impact an athlete's performance in high-pressure situations. For example, research conducted by Gucciardi et al. (2021), highlights that mentally resilient athletes are more likely to manage competitive stress and demonstrate greater resilience during adverse conditions. This resilience not only affects individual performance but can also positively influence team dynamics and overall morale, underscoring the importance of developing mental resilience within athletic programs.

To develop effective interventions, it is important to understand how various psychological factors contribute to mental resilience (Coulter et al., 2020). In particular, for athletes with disabilities, including those with hearing impairments, the structures of mental resilience may manifest differently due to unique stressors they face, such as communication barriers and societal perceptions (Hodge & Smith, 2016). These challenges are magnified by the cognitive and emotional demands of competitive performance, requiring athletes to develop enhanced psychological capacities to succeed. Research has shown that athletic mental energy—defined as a dynamic resource that supports focus, motivation, and emotional regulation—can significantly influence flow state experiences in football players (Yarayan et al., 2025), suggesting a strong connection between internal psychological resources and peak performance.

Mental resilience enables athletes to endure fatigue, pressure, and anxiety, while imagery facilitates effective preparation and adaptive problem-solving during competitions (Sullivan & Johnson, 2019). The unique obstacles they encounter, such as communication difficulties and social stigma, often require the development of robust mental strategies to navigate effectively in competitive environments (Hill & Gritt, 2021). Moreover, recent findings indicate that emotional intelligence and imagery are both significant contributors to the development of mental toughness—a related construct to resilience—further emphasizing the cognitive-emotional interplay required for high-level athletic performance (Akgül, Solmaz, Uzun, & Yarayan, 2024).

Parallel to mental resilience, imagery plays a critical role in shaping athletic performance. Athletes often use imagery techniques to mentally rehearse their performances, enhance focus, and improve skill execution (Feltz & Landers, 1983). The capacity for imagery allows athletes to visualize scenarios and outcomes, which can lead to increased self-efficacy and preparedness. For instance, a study by Cumming and Williams (2021), found that athletes who employed visualization techniques reported higher levels of confidence and were better able to cope with competition anxiety. Guerin et al. (2024) found that especially motivational general imagery type was a strong predictor of mental resilience.

Furthermore, imagery extends beyond simple visualization. It involves cognitive flexibility and enables athletes to adapt their strategies according to changing competitive conditions. This ability is vital for sports success, as it allows athletes to improvise and respond effectively to unexpected challenges during competition (Schempp et al., 2014).). This cognitive agility is

particularly relevant when considering athletes' psychological states under pressure. In this regard, Solmaz and Yarayan (2025) revealed that mindfulness plays a moderating role in the relationship between threat appraisal and negative emotional responses in elite football players, illustrating how metacognitive skills can buffer the effects of stress and improve emotional functioning.

In this context, the imagery abilities of athletes with disabilities, particularly those with hearing impairments, deserve investigation. Considering their unique experiences and challenges, the role of imagery in their training and competitions may differ from that of hearing athletes, making this research particularly significant (Weiss & English, 2020). Additionally, prior findings by Yarayan and Ayan (2018) highlighted that athletes in different team sports display distinct imagery formats based on sport-specific demands, indicating the flexible and contextual nature of mental imagery use among athletes.

The existing literature on athletes with hearing impairments highlights a significant gap in understanding how mental resilience and imagery coexist within this demographic and how they affect performance. Studies conducted by DePauw and Gavron (2011) have emphasized the need for specialized psychological training methods that take into account the different experiences of athletes with disabilities. These athletes often develop unique coping mechanisms and mental strategies to overcome obstacles, indicating higher mental resilience and enhanced imagery capacity when faced with challenges (Miller & Wiese-Bjornstal, 2020). Through comprehensive data collection and analysis, this study aims not only to advance the discussion surrounding sports psychology but also to advocate for inclusive practices that are tailored to the psychological needs of athletes with hearing impairments. By examining mental resilience and imagery processes, this research seeks to pave the way for innovative training programs that can promote resilience and creativity, ultimately enhancing the performance and well-being of athletes facing unique challenges.

It is expected that the findings from this research will contribute more broadly to the field of sports psychology and provide foundational knowledge that can support future research and practical applications aimed at promoting optimal performance among athletes with hearing impairments.

2. METHOD

2.1. Research Model

This study employed a correlational research design, which is a subtype of non-experimental quantitative research. The purpose of this design is to identify the degree and direction of the relationship between two or more variables without manipulating them Correlational research is particularly suitable when researchers seek to explore associations between psychological constructs based on naturally occurring data. Given that both mental resilience and imagery are continuous psychological variables, this design allows for the analysis of predictive relationships without inferring causality (Creswell & Creswell, 2018). Within the scope of this study, it was aimed to examine the relationship between mental toughness and imagery levels of hearing impaired national team athletes in 2024.

2.2. Hypotheses

H1: There is a high level positive relationship between athletes' levels of mental resilience and their theoretical imagery levels.
H2: There is a high level positive relationship between athletes' mental resilience and their scores on the sport imagery inventory.
H3: There is a moderate level positive relationship between the degree of mental resilience and the level of motivational specific imagery in athletes.

H4: There is a moderate level positive relationship between the degree of mental resilience and the level of motivational general mastery in athletes.

2.3. Research Group

Participants were informed about the study and the sample group voluntarily participated in the study. The population of the study consisted of 2024 national team hearing impaired athletes. Initially, a total of 54 volunteer participants, 27 women and 27 men, agreed to participate in the study. After the administration of the data collection tools, the scale forms were reviewed for completeness and accuracy. Forms that were left blank or incorrectly completed were excluded from the final analysis. As a result, 52 valid scale forms consisting of 25 female and 27 male participants were included in the study.

Although the sample size is relatively limited (n=52), the study group comprises elite-level national athletes with hearing impairments, which represents a highly specialized and hard-to-access population. In research involving underrepresented or vulnerable groups, especially athletes with disabilities, smaller sample sizes are common and methodologically acceptable due to accessibility constraints and the uniqueness of the population (DePauw & Gavron, 2011). The insights gathered from this group are valuable for understanding psychological mechanisms such as mental resilience and imagery in a context that remains largely underexplored in the literature. As such, this study contributes not only to the scientific understanding of psychological skills in elite sport, but also promotes inclusivity and diversity in sports psychology research (Patton, 2013).

2.4. Data Collection Tools

Personal Information Form: An information form consisting of questions such as gender, sport branch, age, number of nationality, education level, mother and father's education level was used in the light of the existing literature and created by researchers.

Sport Imagery Questionnaire

The Sport Imagery Questionnaire, developed by Hall, Mack, Paivio, and Hausenblas (1998), was validated in Turkish by Kızıldağ and Tiryaki (2012). The inventory consists of four sub-dimensions: "Cognitive Imagery," "Motivational Specific Imagery," "Motivational General-Arousal," and "Motivational General-Mastery." The calculated Cronbach alpha reliability coefficients for the sub-dimensions are as follows: .81 for the "Cognitive Imagery" sub-dimension, .80 for the "Motivational Specific" sub-dimension, .71 for the "Motivational General Arousal" sub-dimension, and .59 for the "Motivational General Mastery" sub-dimension (Kızıldağ and Tiryaki, 2012).

Sports Mental Resilience Inventory

The Sports Mental Resilience Inventory, developed by Sheard, Golby, and Van Wersch (2009), consists of a total of 14 items. In addition to overall mental resilience, the inventory comprises three sub-dimensions: confidence, continuity, and control. It uses a four-point Likert scale. The adaptation of the inventory into Turkish was conducted by Altıntaş (2015). The Cronbach's Alpha internal consistency reliability coefficient for the Sports Mental Resilience Inventory in this sample was found to be.70. When evaluating the sub-scales, the Cronbach Alpha internal consistency reliability coefficient for the confidence sub-scale was .66, for the continuity sub-scale it was .56, and for the control sub-scale it was .60 (Altıntaş, 2015).

2.5. Data Analysis

The data obtained from the research were transferred to a computer environment, organized using Microsoft Excel, and then analyzed using SPSS (Statistical Package for Social Sciences) version 29.0. Before starting the analyses, the normality of the numerical data was examined using the Kolmogorov-Smirnov test, Shapiro-Wilk test, Skewness, and Kurtosis tests, along with Histogram and Q-Q Plot graphics. As a result of the Box plot analysis for outlier detection, data from 2 participants were identified as outliers and these individuals were excluded from the analysis, allowing the study to continue with 52 participants. After the outlier data cleaning, the analyses indicated that the data were normally distributed. Categorical data were presented with frequency and percentage values, while numerical data were presented with mean and standard deviation values due to the fulfillment of normality assumptions. For data analysis, the "Independent Sample T-Test" was used for comparisons between two independent groups, and the "One-Way ANOVA" test was used when there were more than two independent groups. The "Pearson Correlation Test" was employed to examine the relationship between two numerical variables. The statistical significance level was accepted as $p < 0.05$ for all tests.

2.6. Ethics Committee Approval

Ethical rules have been followed in the preparation of the conceptual framework of this research, the application of data collection tools, data collection, data analysis and interpretation. ANKAD Editorial Board has no responsibility for any ethical violations that may be encountered. All responsibility belongs to the authors. I undertake that this study has not been sent to any academic publication environment other than ANKAD for evaluation. In this study, all the rules specified to be followed within the scope of "Higher Education Institutions Scientific Research and Publication Ethics Directive" have been followed. None of the actions specified under the second part of the Directive, "Actions Contrary to Scientific Research and Publication Ethics", have been carried out. Ethical approval for this research was obtained from the Siirt University Rectorate, dated February 16, 2024, with approval number 6492. Informed consent was obtained from all participants prior to their participation in the study.

3. FINDINGS

Table 1. Descriptive Statistics of Athletes' Demographic Characteristics

Variables	n	%
Gender		
Female	25	48,1%
Male	27	51,9%
Age ($\bar{x}$±SS), (Lower-Upper Value)	25,33±5,94	18-49
18-25 Age	26	50,0%
25 Over age	26	50,0%
Number of Siblings ($\bar{x}$±SS), (Lower-Upper Value)	2,29±1,05	1-6
Sports Branch		
Basketball	19	36,5%
Volleyball	17	32,7%
Handball	16	30,8%

Total Training Duration (year) ($\bar{x}$±SS), (Lower-Upper Value)	9,51±5,09	1-20
Number of Caps ($\bar{x}$±SS), (Lower-Upper Value)	7,21±6,50	1-20
1-5 Range	25	48,1%
5 and Above	27	51,9%
Educational Status		
Primary Education	3	5,8%
High School	24	46,2%
Associate Degree (2 Years)	9	17,3%
Bachelor's Degree (4 Years)	16	30,8%
Mother's Educational Status		
Primary Education	38	73,1%
High School	10	19,2%
Associate Degree (2 Years)	2	3,8%
Bachelor's Degree (4 Years)	2	3,8%
Father's Educational Status		
Primary Education	28	53,8%
High School	17	32,7%
Associate Degree (2 Years)	1	1,9%
Bachelor's Degree (4 Years)	5	9,6%
Primary Education	1	1,9%

$\bar{x}$±SS=Mean± Standard Deviation

In Table 1, descriptive statistics regarding the demographic characteristics of the athletes are presented. When examining the distribution of gender among the athletes, it was found that the percentage of females is 48.1% (n=25) while the percentage of males is 51.9% (n=27). The average age is 25.33 (SD=5.94), with 50% of the athletes aged between 18-25 and 50% being over 25 years old. The average number of siblings is 2.29 (SD=1.05), and 36.5% of the athletes play basketball (n=19), 32.7% play volleyball (n=17), and 30.8% play handball (n=16). The average total training duration is calculated as 9.51 years (SD=5.09), while the average number of caps is determined to be 7.21 (SD=6.50); 48.1% of the athletes have a number of caps between 1-5, while 51.9% have 5 or more caps. In terms of educational status, 46.2% of the athletes are high school graduates, 30.8% have a bachelor's degree (4 years), 17.3% have an associate degree (2 years), and 5.8% are primary school graduates. Regarding the mother's educational status, it shows that 73.1% are primary school graduates, while in the father's educational status, those who are primary school graduates hold the highest percentage at 53.8%.

Table 2. Statistics of the Scales Included in the Study

	$\bar{x}$±SS	Lower-upper value	CA (α)	Skewness	Kurtosis
Cognitive Imagery	38,27±5,74	21-45	0,853	-0,718	0,541
Motivational Specific Imagery	22,06±3,61	13-25	0,799	-1,135	0,134
Motivational General Arousal	15,21±4,59	6-20	0,837	-0,535	-0,927
Motivational General Mastery	12,79±2,20	6-15	0,521	-1,100	1,078
Sport Imagery Questionnaire	**88,33±13,05**	**57-105**	**0,904**	**-0,452**	**-0,497**
Mental Resilience Scale	**48,69±6,08**	**30-55**	**0,890**	**-1,216**	**1,347**

$\bar{x}$±SS=Mean± Standard Deviation, CA (α)=Cronbach's Alpha

In Table 2, the statistics for the sub-dimensions of the Sport Imagery Questionnaire and the Mental Resilience Scale are presented. The mean and standard deviation values for the Sport Imagery Questionnaire are 83.33±13.05, with lower and upper values of 57-105, while the mean and standard deviation values for the Mental Resilience Scale are 48.69±6.08, with lower and upper values of 30-55. The Cronbach Alpha coefficient is interpreted as follows: when $0.00 < \alpha < 0.40$, the scale is not reliable; when $0.40 < \alpha < 0.60$, it has low reliability; when $0.60 < \alpha < 0.80$, it is quite reliable; and when $0.80 < \alpha < 1.00$, it is highly reliable (Tavakol & Dennick, 2011). Upon examining Table 1, it can be seen that cognitive imagery, motivational specific imagery, motivational general arousal, the Sport Imagery Questionnaire, and the Mental Resilience Scale have high reliability, while the motivational general mastery sub-dimension has low reliability. Tabachnick and Fidell (2013) stated that if the skewness and kurtosis values are between -1.5 and +1.5, the data follows a normal distribution. Looking at the Skewness and Kurtosis values, it appears that the sub-dimensions of the Sport Imagery Questionnaire and the Mental Resilience Scale meet the normal distribution assumption.

Table 3. Analysis of the Differences between the Sport Imagery Questionnaire and Its Sub-Dimensions with Respect to Gender, Age Group, Sport Type, and Number of Caps

Variables		Cognitive Imagery		Motivational Specific Imagery		Motivational General Arousal		Motivational General Mastery		Sport Imagery Questionnaire	
	n	$\bar{x}$	SS	$\bar{x}$	SS	$\bar{x}$	SS	$\bar{x}$	SS	$\bar{x}$	SS
Gender											
Female	25	39,44	5,25	22,88	2,83	16,28	4,58	13,24	1,98	91,84	12,66
Male	27	37,19	6,05	21,30	4,11	14,22	4,47	12,37	2,34	85,07	12,77
t		1,430		1,605		1,640		1,440		1,917	
p		0,159		0,115		0,107		0,156		0,061	
Age											
18-25 Age	26	38,31	5,11	22,54	3,20	14,96	4,80	12,92	1,94	88,73	12,60
25 Over age	26	38,23	6,41	21,58	3,98	15,46	4,47	12,65	2,46	87,92	13,72
t		0,048		0,959		0,389		0,438		0,221	
p		0,962		0,342		0,699		0,663		0,826	

Sports Branch											
Basketball	19	38,63	5,05	22,00	3,43	14,47	5,23	12,68	2,58	87,79	13,86
Volleyball	17	38,53	4,45	22,24	3,09	15,12	4,53	12,76	1,64	88,65	10,61
Handball	16	37,56	7,72	21,94	4,46	16,19	3,92	12,94	2,35	88,63	15,09
F		0,171		0,031		0,600		0,057		0,024	
p		0,843		0,970		0,553		0,945		0,976	
Number of Caps											
1-5 Range	25	38,28	5,06	22,60	3,35	16,28	3,71	13,00	2,04	90,16	11,69
5 and Above	27	38,26	6,40	21,56	3,83	14,22	5,15	12,59	2,36	86,63	14,19
t		0,013		1,043		1,640		0,664		0,974	
p		0,990		0,302		0,107		0,510		0,335	

$\bar{x}$= Mean, SS= Standard Deviation, t= Independent-Samples t Testi, F= One-Way ANOVA Testi, p<0,05

In Table 3, the analysis results regarding the differences between the Sport Imagery Questionnaire and its sub-dimensions with respect to gender, age group, sport type, and number of caps are presented. No statistically significant differences were found between athletes' cognitive imagery levels and gender (t=1.430, p=0.159), age (t=0.048, p=0.962), sport type (F=0.171, p=0.843), and number of caps (t=0.013, p=0.990) (p>0.05).

Similarly, no statistically significant differences were found between athletes' motivational specific imagery levels and gender (t=1.605, p=0.115), age (t=0.959, p=0.342), sport type (F=0.031, p=0.970), and number of caps (t=1.043, p=0.302) (p>0.05).

For athletes' motivational general arousal levels, no statistically significant differences were found with respect to gender (t=1.640, p=0.107), age (t=0.389, p=0.699), sport type (F=0.600, p=0.553), and number of caps (t=1.640, p=0.107) (p>0.05).

Regarding athletes' motivational general mastery levels, no statistically significant differences were found in relation to gender (t=1.440, p=0.156), age (t=0.438, p=0.663), sport type (F=0.057, p=0.945), and number of caps (t=0.664, p=0.510) (p>0.05).

Finally, for the Sport Imagery Questionnaire overall, no statistically significant differences were found when comparing gender (t=1.917, p=0.061), age (t=0.221, p=0.826), sport type (F=0.024, p=0.976), and number of caps (t=0.974, p=0.335) (p>0.05).

Table 4. Analysis of the Differences between the Mental Resilience Scale and Its Correlation with Gender, Age Group, Sport Type, and Number of Caps

		Mental Resilience Scale			
Variables	n	Mean	SS	t/F*	p
Gender					
Female	25	50,12	6,48	1,657	0,104
Male	27	47,37	5,47		
Age					
18-25 Age	26	48,88	5,89	0,408	0,822

25 Over age	26	48,50	6,37		
Sports Branch					
Basketball	19	49,37	5,96	0,254*	0,776
Volleyball	17	48,71	5,95		
Handball	16	47,88	6,64		
Number of Caps					
1-5 Range	25	47,36	5,80	1,541	0,130
5 and Above	27	49,93	6,18		

SS= Standard Deviation, t= Independent-Samples t Testi, F= One-Way ANOVA Testi, p<0,05

In Table 4, the analysis results regarding the differences between the Mental Resilience Scale and its correlation with gender, age group, sport type, and number of caps are presented. No statistically significant differences were found between athletes' mental resilience scale scores and gender (t=1.657, p=0.104), age (t=0.408, p=0.822), sport type (F=0.254, p=0.776), and number of caps (t=1.541, p=0.130) (p>0.05).

Table 5. Analysis of the Relationship between the Sub-Dimensions of the Sport Imagery Questionnaire and the Mental Resilience Scale

		1	2	3	4	5	6
1- Cognitive Imagery	*r*	1	,484	,460	,732	,859	,779
	p		<,001	<,001	<,001	<,001	<,001
2- Motivational Specific Imagery	*r*		1	,425	,629	,745	,417
	p			,002	<,001	<,001	,002
3- Motivational General Arousal	*r*			1	,565	,767	,179
	p				<,001	<,001	,204
4- Motivational General Mastery	*r*				1	,863	,598
	p					<,001	<,001
5- Sport Imagery Questionnaire	*r*					1	,622
	p						<,001
6- Mental Resilience Scale	*r*						1
	p						

Pearson Correlation Test, p<0,05

In Table 5, the analysis of the relationship between the sub-dimensions of the Sport Imagery Questionnaire and the Mental Resilience Scale is presented. Values of r<0.20 indicate no relationship or a very weak relationship. Values between 0.20-0.39 indicate a weak relationship, between 0.40-0.59 indicate a moderate relationship, between 0.60-0.79 indicate a high level of relationship, and values between 0.80-1.0 indicate a very high relationship (Köklü et al., 2006).

A high-level positive relationship was found between the Mental Resilience Scale and cognitive imagery (rh=0.779, p<0.001) as well as the Sport Imagery Questionnaire (rh=0.662, p<0.001). A moderate positive relationship was identified between motivational specific imagery (rh=0.417, p=0.002) and motivational general mastery (rh=0.598, p<0.001). As the average score obtained by athletes from the Mental Resilience Scale increased, the levels of sport

imagery, Sport Imagery Questionnaire scores, motivational specific imagery, and motivational general mastery also increased.

Table 6. Mental Toughness Multiple Regression Analysis

	$\hat{\beta}$	SE $\hat{\beta}$	Beta	t	p değeri
(Constant)	15,173	4,018		3,776	<,001
Cognitive Imagery	,803	,134	,758	6,002	<,001
Motivational Special Imagery	,121	,185	,072	,652	,518
Motivational General Arousal	-,387	,138	-,292	-2,808	,007
Motivational General Mastery	,456	,411	,165	1,110	,273
Total Training Duration (years)	,020	,103	,017	,196	,846
	R^2	Adj. R^2	F	p	
	,817	,667	18,421	<,001	

Dependent Variable: Mental Resilience Scale

In Table 6, The effect of cognitive imagery, motivational private imagery, motivational general arousal, motivational general arousal, motivational general mastery and total training time on mental toughness is shown in the Table by examining multiple regression analysis. The effect of the variables included in the model on mental toughness is significant (F=18,421; p<0,001) and Cognitive imagery, motivational private imagery, motivational general arousal, motivational general mastery and total training time explain 67% of mental toughness (Adj. R2=0,667).

When the variables included in the model are analyzed individually, cognitive imagery (β=0.803, t=6.002, p<0.001) has a positive effect and motivational general arousal (β=-0.387, t=-2.808, p<0.001) has a significant and negative effect.

4. DISCUSSION AND CONCLUSION

This study provides significant insights into the relationship between imagery, mental resilience, and performance outcomes among national team athletes with hearing impairments. The findings show a significant positive correlation between imagery and various dimensions of mental resilience, consistent with previous research in sports psychology. In particular, high levels of cognitive imagery were strongly associated with mental resilience (rh = 0.779, p < 0.001), indicating that athletes who effectively utilize cognitive strategies tend to demonstrate greater resilience and perseverance in competitive environments (Cumming & Williams, 2012).

This reinforces the importance of mental imagery as a psychological skill that can enhance performance. The results suggest that as athletes' mental resilience scores increase, their imagery skills in various dimensions, including motivational specific imagery and motivational general mastery, also improve. This finding is particularly important as it supports theoretical frameworks proposed by Vealey (1986), which argue that mental skills, including imagery, significantly contribute to athlete performance and coping strategies. Mental resilience significantly increases psychological resilience and well-being in both hearing impaired and non-hearing impaired athletes, and hearing impaired athletes have been found to exhibit these characteristics at higher levels (Akoğlu, Yıldız, & Uslu, 2024).

4.1. Hypotheses:

H1: There is a high level positive relationship between athletes' levels of mental resilience and their theoretical imagery levels.

H2: There is a high level positive relationship between athletes' mental resilience and their scores on the sport imagery inventory.

H3: There is a moderate positive relationship between the degree of mental resilience and the level of motivational specific imagery in athletes.

H4: There is a moderate positive relationship between the degree of mental resilience and the level of motivational general mastery in athletes.

In the context of these hypotheses, Table 5 presents the model related to our research.

Table 7. Research Model

Hypothesis No.	Hypothesis Explanation	Affected Hypotheses	Explanation
H1	There is a high level positive relationship between athletes' levels of mental resilience and their levels of cognitive imagery. .	**H2, H3, H4**	An increase in cognitive imagery may positively affect mental resilience; therefore, it is connected to the other hypotheses.
H2	There is a high level positive relationship between athletes' levels of mental resilience and their scores on the Sport Imagery Questionnaire.	**H1, H3, H4**	Sport imagery may be an indicator of mental resilience and can also influence other types of imagery.
H3	There is a moderate level positive relationship between athletes' levels of mental resilience and their levels of motivational specific imagery.	**H1, H2, H4**	An increase in motivational specific imagery may positively influence mental resilience.

H4	There is a moderate level positive relationship between athletes' levels of mental resilience and their levels of motivational general mastery.	**H1, H2, H3**	The level of motivational general mastery also influences mental resilience and is connected to overall imagery ability.

Furthermore, the moderate-level correlations found between mental resilience and motivational specific imagery ($rh = 0.417$, $p = 0.002$) and motivational general mastery imagery ($rh = 0.598$, $p < 0.001$) indicate that while imagery is an important component of mental resilience, other factors may also play a significant role in developing resilience among athletes with hearing impairments. This aligns with the findings of Gucciardi et al. (2015), which emphasize that mental resilience encompasses a range of processes including emotional regulation, goal setting, and self-confidence.

The unique challenges faced by athletes with hearing impairments, such as communication barriers and social stigmatization, necessitate specialized psychological interventions. Being aware of these challenges highlights the need for coaches and sports psychologists to incorporate imagery training into their practices as a means to strengthen athletes' mental resilience (Hodge & Smith, 2016). Yalçın et al., (2022) found that imagery skills in athletes were significantly and positively related to both mental resilience and sport self-confidence; this finding suggests that imagery can be an important tool in increasing athletes' psychological resilience and self-confidence. The findings of this study support the idea that enhancing both imagery skills and mental resilience in athletes with hearing impairments could lead to improvements in performance and overall well-being.

In conclusion, this study contributes to the growing literature on sports psychology by illuminating the reciprocal relationship between imagery, mental resilience, and performance among national team athletes with hearing impairments. The results indicate a strong relationship between high levels of mental resilience and effective use of imagery, highlighting the potential benefits of imagery-based training programs.

Future research should further explore specific types of imagery that provide the most benefit for athletes with hearing impairments and how coaching methods can be adapted to support the development of these skills. Additionally, investigating the effects of other psychological factors, such as anxiety and self-efficacy, on mental resilience and imagery within this unique population would also be valuable.

Furthermore, the practical implications derived from this study suggest that sports organizations and coaches should consider implementing structured imagery training sessions. Such interventions could enhance the mental resilience of athletes with hearing impairments, fostering not only better performance outcomes but also supporting positive psychological health.

As we move towards a more inclusive understanding of sports psychology, it will be crucial to acknowledge and address the unique experiences of athletes with hearing impairments. This research emphasizes the need for personalized psychological support that aligns with the cognitive processes and challenges faced by these athletes. Implementing these insights can

enhance the overall competitive experience for national team athletes with hearing impairments and lead them to greater successes both on and off the field.

4.2. Strengths, Limitations, and Recommendations

Strengths of the Study

- This study focuses on elite-level national athletes with hearing impairments, a highly specialized and underrepresented population in sports psychology research. The inclusion of this unique group increases the originality and social relevance of the findings.
- The research contributes to the literature by bridging a gap in psychological skills training among athletes with disabilities, promoting inclusive and evidence-based coaching strategies.

Limitations

- The sample size (n=52) is relatively small, which may limit the generalizability of the findings to broader populations. However, due to the elite and specific nature of the sample, such constraints are expected and methodologically acceptable
- The cross-sectional design limits causal inferences regarding the directionality of the relationships observed.
- The research is conducted in a single country and cultural context (Turkey), which may limit its applicability to international populations of hearing-impaired athletes.

Recommendations for Future Research

- Future studies should consider increasing the sample size and incorporating multicenter or cross-cultural comparisons to enhance the generalizability of findings.
- Employing longitudinal or experimental designs could help establish causal relationships between mental resilience, imagery, and performance outcomes.
- Including qualitative approaches, such as interviews or focus groups, could enrich understanding of the lived experiences and coping strategies used by athletes with hearing impairments.

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Research Article

İşitme Engelli Milli Sporcularda Zihinsel Dayanıklılık ve İmgeleme Düzeylerinin Belirlenmesi

Determining the Levels of Mental Resilience and Imagery in National Team Athletes with Hearing Impairments

Büşra ÖZCAN

GENİŞ ÖZET

Giriş

Rekabetçi sporların dinamik ve yüksek riskli dünyasında, psikolojik dayanıklılık ve bilişsel hazırlık kombinasyonu, atletik başarı için giderek daha kritik bir öneme sahip olarak kabul edilmektedir. En çok incelenen psikolojik yapılar arasında, bireyin baskı altında odaklanma ve performans gösterme becerisi olarak tanımlanan zihinsel dayanıklılık (Clough vd., 2002) ve performansı görselleştirme, stratejik düşünme ve duygusal düzenlemeyle ilgili geniş bir bilişsel süreç yelpazesini kapsayan imgeleme yer almaktadır.Zihinsel dayanıklılık genellikle özgüven, bağlılık, odaklanma ve aksiliklerden toparlanma yeteneği gibi niteliklerle karakterize edilir (Cowden, 2018). Son çalışmalar, zihinsel dayanıklılığın bir sporcunun yüksek baskı altındaki performansını önemli ölçüde etkileyebileceğini göstermiştir. Örneğin, Gucciardi vd. (2021) tarafından yürütülen bir araştırma, zihinsel olarak dayanıklı sporcuların rekabet stresini yönetme ve olumsuz koşullarda daha fazla dayanıklılık gösterme olasılıklarının daha yüksek olduğunu vurgulamaktadır. Bu dayanıklılık sadece bireysel performansı etkilemekle kalmıyor, aynı zamanda takım dinamiklerini ve genel morali de olumlu yönde etkileyebiliyor ve atletik programlar içerisinde zihinsel dayanıklılığın geliştirilmesinin önemini vurguluyor. Bu bağlamda, bu çalışmanın amacı, işitme engelli milli sporcularda zihinsel dayanıklılık ve imgeleme düzeylerinin çeşitli değişkenler açısından incelenmesidir.

Yöntem

Araştırma, ilişkisel tarama modeline dayanan nicel bir çalışmadır. Katılımcılar, Türkiye'de işitme engelli bireylerden oluşan milli takım düzeyindeki 54 profesyonel sporcudan oluşmuştur. Aykırı değer analizi (Boxplot) sonucunda 2 katılımcı verisi çıkarılarak analizler 52 katılımcı üzerinden yürütülmüştür. Veri toplama araçları olarak "Kişisel Bilgi Formu", "Spor İmgeleme Ölçeği" ve "Spor Zihinsel Dayanıklılık Envanteri" kullanılmıştır. Verilerin analizinde SPSS 29.0 programı kullanılmış, betimsel istatistiklerin yanı sıra bağımsız örneklem t-testi, tek yönlü ANOVA, Pearson korelasyon ve çoklu regresyon analizlerinden yararlanılmıştır.

Tartışma ve Sonuç:

Bu çalışmanın temel amacı, işitme engelli milli sporcularda zihinsel dayanıklılık ve imgeleme düzeyleri arasındaki ilişkiyi incelemek ve bu iki psikolojik değişkenin sporda performans üzerindeki etkilerini ortaya koymaktır. Bulgular, bu iki değişken arasında anlamlı ve pozitif ilişkiler bulunduğunu ortaya koymuştur. Bu sonuç, zihinsel becerilerin ve imgeleme yetisinin, spor performansını yükselten önemli faktörler olduğuna dair mevcut literatürle örtüşümektedir (Cumming & Williams, 2021; Vealey, 1986).

Özellikle bilişsel imgelemenin, zihinsel dayanıklılık üzerindeki etkisi dikkat çekicidir. Çalışma bulgularına göre, bilişsel imgeleme ile zihinsel dayanıklılık arasındaki ilişki yüksek düzeydedir ($r = .779$, $p < .001$). Bu durum, sporcuların rekabet çevresinde karşılaştıkları baskı ve stresle başa çıkma becerilerinin gelişiminde imgeleme tekniklerinin önemli bir rol oynadığını ortaya

koymaktadır (Gucciardi et al., 2021; Sullivan & Johnson, 2019). Aynı zamanda, zihinsel dayanıklılığın sporcuların duygusal düzenleme ve motivasyonel süreçlerinde de etkili olduğu göz önüne alındığında, bu ilişkinin sporcunun performansını dolaylı olarak da artırabileceği sonucuna varılmaktadır (Cowden, 2018).

Ayrıca, motivasyonel özel imgeleme ($r = .417$, $p = .002$) ve motivasyonel genel ustalık imgelemesi ($r = .598$, $p < .001$) ile zihinsel dayanıklılık arasındaki orta düzeyde pozitif ilişkiler, imgelemenin duygusal ve motivasyonel boyutlarının da zihinsel dayanıklılığı beslediğini göstermektedir. Bu bulgu, Akgül et al. (2024) tarafından belirtilen duygusal zeka ve imgelemenin zihinsel dayanıklılık üzerindeki ortak etkilerini desteklemektedir. İşitme engelli sporcuların karşılaştıkları sosyo-duygusal engeller, bu bireylerin daha yaratıcı ve içsel stratejiler geliştirmesine neden olmaktadır (Hodge & Smith, 2016; Hill & Gritt, 2021).

Regresyon analizleri incelendiğinde, zihinsel dayanıklılığın %67 oranında imgeleme alt boyutları tarafından açıklandığı görülmektedir. Bu yüksek oranda açıklama, imgeleme tekniklerinin zihinsel dayanıklılığın gelişiminde ne denli etkili olduğuna işaret etmektedir. Özellikle bilişsel imgeleme, anlamlı ve pozitif yordayıcı olarak öne çıkarken ($\beta = .803$, $p < .001$), motivasyonel genel uyarılma imgelemesinin negatif etkisi ($\beta = -.387$, $p = .007$), imgeleme çalışmalarının her zaman pozitif etki yaratmayabileceğine işaret etmektedir. Bu durum, spor psikologlarının bireyselleştirilmiş ve kontrollü psikolojik destek planları tasarlaması gerekliliğine vurgu yapar (Schempp et al., 2014; Yarayan et al., 2025).

Bu bağlamda, yapılandırılmış imgeleme programlarının işitme engelli sporcular için geliştirilmesi önem arz etmektedir. Bu programlar sadece performans artışına değil, aynı zamanda sporcunun genel psikolojik iyi oluşuna da katkı sağlayabilir. Yarayan ve Ayan (2018) tarafından farklı takım sporlarında yapılan bir çalışma, imgeleme tekniklerinin spor türüne göre değişiklik gösterebildiğini ortaya koymuş, bu da bireysel yaklaşımın gerekliliğine işaret etmektedir.

Sonuç olarak, işitme engelli milli sporcularda zihinsel dayanıklılık ve imgeleme arasındaki ilişki, performans psikolojisi alanında dikkate değer bir katkı sunmaktadır. Bu bulgular, spor psikolojisinde bireyselleşmiş yaklaşımın ve imgeleme temelli eğitimlerin yaygınlaştırılmasının gerekliliğini ortaya koymakta, sporcunun sadece fiziksel değil psikolojik kapasitesinin de geliştirilmesi gerektiğini vurgulamaktadır.