

RESEARCH

Open Access



Imagery and motivation in performance sports: a psychological study on weightlifters

Ebu Bekir Siddik Aksoy¹ and Mehmet Ali Ceyhan^{2*}

Abstract

Background This study investigates the relationship between imagery use and motivation among weightlifters, focusing on how demographic factors like gender, education level, and national status influence these aspects. Imagery, a mental strategy used to achieve goals and motivation, an intrinsic driving force, is explored within weightlifting. Despite research linking mental strategies to performance, studies targeting weightlifters still need to be expanded. This study examines how imagery impacts this group's motivation levels and technical performance.

Methods The study included 347 licensed athletes participating in the 2022 Turkish Individual Junior and U-23 Weightlifting Championship in Van. Data were collected online using the "Personal Information Form," the "Sport Imagery Questionnaire," and the "Sport Motivation Scale." Analyses were conducted with SPSS, assessing normality through skewness and kurtosis. Parametric tests, such as t-tests and one-way ANOVA, were applied for group comparisons. At the same time, Pearson's Correlation Coefficient was used to explore relationships between continuous variables, including age, years of experience, and competition weight category.

Results A significant positive correlation was found between imagery use and motivation, particularly in the Cognitive Imagery (CI), Motivational Specific Imagery (MSI), and Motivational General-Mastery (MGM) subdimensions. Education level significantly influenced imagery use and motivation, with higher levels linked to better mental training and increased motivation. Although gender did not significantly affect these factors, female athletes displayed more robust emotional responses, enhancing their ability to use positive emotions effectively. Age and sports experience were also positively associated with effective imagery use, indicating that experienced athletes leverage mental strategies more proficiently.

Conclusions The findings emphasize imagery as a vital tool for enhancing motivation and performance in weightlifters. Athletes with higher education levels and more experience benefit more from mental training. Future research should broaden its scope to include diverse sports and age groups, while longitudinal studies can provide deeper insights into the evolution of imagery and motivation over time.

Keywords Weightlifting, Imagination, Motivation, Sports psychology, Sports training

*Correspondence:

Mehmet Ali Ceyhan
mehmetaliceyan@bayburt.edu.tr

¹Bayburt Provincial Directorate of Youth and Sports, Bayburt, Turkey

²Faculty of Sport Sciences, Bayburt University, Bayburt, Turkey



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

Introduction

Various variables can influence performance in sports, one of which is imagery. When examining definitions of the imagery variable, it becomes evident that humans possess a multifaceted ability to mentally conceptualize events, actions, or phenomena that have occurred, may occur, or are entirely hypothetical [1]. This imaginative process begins with the creation of a mental image. The term “image,” in its literal sense, is defined as “something envisioned and desired in the mind; a dream or aspiration” [2]. Another definition describes imagery as the visualization or cognitive rehearsal of action in the absence of physical performance [3].

When analyzing the term “imagery,” various definitions emerge. Imagery involves utilizing all the senses to mentally simulate or reconstruct a specific experience [4]. It refers to an internal representation that generates a perceptual experience in the absence of appropriate sensory input [5].

In addition to imagery, motivation is one of the key variables influencing performance in sports. The term “motivation” originates from the Latin words *more* and *mot*, meaning “to move,” and is further defined as a dominant internal force that compels an individual to engage in specific behaviours [6]. Motivation can also be described as how an individual initiates action toward desired goals, sustains this action over time, and positively aligns behaviour with the intended outcomes [7]. Another definition characterizes motivation as the intensity and direction of the effort exerted by an individual to achieve their goals [8].

According to researchers, motivation represents the internal driving force that propels individuals toward their objectives. Specifically, it enables individuals to meet their achievement needs and attain personal satisfaction [9].

One of the most critical and specific topics in sports psychology is motivation. Research on this concept provides valuable insights into why individuals engage in, sustain, or abandon a particular sport or recreational activity [10]. In sports, motivation is a psychological phenomenon that influences the emotions and needs of individuals participating in activities, guiding them toward achieving their desired performance outcomes. The relationship between success and motivational strength is particularly tied to sports. Actions driven by low motivational power are inevitably prone to failure.

Every individual seeks an environment that fosters contentment and personal satisfaction while avoiding circumstances that may cause discomfort. By nature, motives inherently involve a balance between avoidance and approach behaviours. When faced with positive or negative situations, the dominant tendency shapes the direction of motivation [11]. Motivation is one of the

primary factors affecting the performance development of athletes, creating the conditions necessary for their readiness. While some athletes lose track of time during training sessions, others may perceive physical activity as monotonous and time-consuming. These differences arise from the three core components of motivation: direction, persistence, and intensity [6].

Motivation is a pivotal factor in shaping athletes’ and coaches’ behaviours and behavioural dynamics, fostering essential qualities such as patience, learning, and performance. It situates the athlete-coach relationship at the core of the sporting experience [12]. Coaches must discern what matters most to their athletes and what does not. Coaches who adopt this awareness can significantly enhance their athletes’ motivation, ensuring steady progress toward individual and team success [7].

Given these variables, weightlifting, as the focus of our research, stands out as a performance sport significantly influenced by these factors. Weightlifting has been integral to the modern Olympics, boasting a long-standing history and widespread international participation. Thanks to this legacy, the sport continues to expand its global reach. In Turkey, weightlifting enjoys a substantial following and ranks among the sports with the highest number of medals won in the history of the Olympic Games [2].

The weightlifting discipline fundamentally comprises two techniques: the snatch and the clean and jerk. Weightlifting movements are characterized as ballistic resistance exercises, requiring rapid acceleration during each phase of the movement and the mobilization of the barbell at high speeds [13]. The two primary exercises are the snatch (SN) and the clean and jerk (C&J) [14].

In light of this context, the primary aim of this study is to examine the relationship between the use of imagery and motivational sources among weightlifters.

Materials and methods

In this section of the study, information on the research model, universe and sample, data collection tools and data analysis on the examination of the relationship between weightlifters’ imagery use and motivation sources is given.

In our research, an online database was used in the data collection method. Participants were reached electronically via e-mail. Data collection tools in the research were; “Personal Information Form”, “Imagery Inventory in Sports” [16]. and “Motivation Scale in Sports” [17].

The “Personal Information Form” prepared by the researcher in order to determine the personal data of the sample group consists of 8 items. These items are; gender, age, education level, sports age, national sportsmanship status, weight class, best degree status and which technique you are more successful in.

The Turkish adaptation of the Sports Imagery Inventory, developed by Gregg, Hall [47], and its reliability and validity study were carried out by Kızıldağ [16]. The first version of the scale had 5 sub-dimensions and 30 items, but as a result of the inventory study, it was formed with 4 sub-dimensions and 21 items. In order to test the structural validity of the inventory, the data were subjected to factor analysis. 4 factors explained almost 51% of the variance. There are four separate sub-dimensions in the inventory. These are; “Cognitive Imagery” (CI), “Motivational Specific Imagery” (MSI), “Motivational General-Arousal” (MGA) and “Motivational General-Mastery” (MGM). When we examine the Cronbach Alpha reliability coefficients calculated for the sub-dimensions of the inventory; it was found as 0.81 for the “CI” sub-dimension, 0.80 for the “MSI” sub-dimension, 0.71 for the “MGA” sub-dimension and 0.59 for the “MGM” sub-dimension. The reliability coefficient of the inventory applied for test-retest reliability is 0.74 for “CI”, 0.91 for “MSI”, 0.88 for “MGA”, and 0.90 for “MGM” [16].

The Motivation in Sport Scale, originally developed by Pelletier et al., consists of 28 items and seven sub-dimensions: “intrinsic motivation to know” (IM-K), “intrinsic motivation to achieve” (IM-A), “intrinsic motivation to experience stimuli” (IM-S), “introjection” (I), “identification” (ID) and “unamotivation” (AM). The Turkish adaptation of the mentioned scale was made by Kazak [17]. The 28 items are evaluated on a 7-point Likert-type scale between 1 and 7, where “1: Not at all appropriate – 7: Completely appropriate”. When we examine the internal consistency coefficients of the sub-dimensions of the Motivation in Sports Scale; for “Intrinsic Motivation to Know-Achieve” (IM-K) (0.88), for “Intrinsic Motivation to Experience Stimuli” (IM-S) (0.73), for “External Regulation” (ER) (0.74), for “Introjection” (I) (0.82), for “Identification” (ID) (0.72), and for “Umotivation” (UM) (0.70) [17].

For the purpose of our study, the relational screening model was used in our research to examine the types of imagery used by weightlifting athletes and their motivation levels related to this situation and to determine the relationship between them. The relational screening model is called the screening approach that adopts the aim of determining the existence of a co-variation situation between two or more variables. With the relational screening model, it is attempted to determine both the extent to which the variables change together and, if there is a change, how this happens [15].

The universe of the research consists of athletes participating in the Turkish Individual Youth and U-23 Weightlifting Championship held in Van province on 20–24 July 2022. The convenience sampling method was used to determine the sample group and 347 weightlifters were included in the study.

Table 1 Percentages and frequencies of participants' demographic variables

Variable	Group	f	%
Gender	Female	157	45.20
	Male	190	54.80
Educational Background	High School	191	55.00
	University	156	45.00
National Athlete Status	Yes	161	46.40
	No	186	53.60
Best Achievement	Regional Achievement	53	15.30
	National Achievement	156	45.00
	International Achievement	138	39.80
Technique	Snatch	199	57.30
	Clean and Jerk	148	42.70

Table 2 Descriptive statistics for age, athletic experience, and weight category variables

Variable	Mean	Standard Deviation	Min.	Max.
Age (Years)	19,47	1,72	18,00	23,00
Athletic Experience (Years)	6,48	3,92	1,00	13,00
Weight Category (Kg)	70,98	16,56	45,00	109,00

The raw data obtained through the data collection tools of the study were analyzed using SPSS version 26. In this analysis process, firstly, tests were conducted on the kurtosis and skewness-kurtosis values of the groups. As a result of the data obtained here, it was decided to use parametric tests. Independent sample t-test was used for difference tests, and One-Way ANOVA was used for variables with three or more groups. The Pearson Correlation Coefficient test was used to test the relationship between ungrouped variables (age, sport age, competition weight) and the sub-dimensions of the scales. The statistical significance level in the obtained data was considered as “ $p < 0.05$ ”.

Results

The study's results section presents the findings obtained from data analysis through tabular representation, accompanied by their interpretation.

Demographic information about the research group is given in Table 1. While 53 (15.3%) of the athletes have regional degrees, 156 (45.0%) have national degrees and 138 (39.8%) have international degrees. 199 (57.3%) of the athletes preferred the snatch technique and 148 (42.7%) preferred the clean and jerk technique as more successful.

Upon examining Table 2, it was determined that the participants' average age was 19.48 ± 1.73 years, their average athletic experience was 6.48 ± 3.92 years, and their average weight category was 70.98 ± 16.56 kg.

According to Table 3, no significant differences were observed across any subdimensions of the Sport Motivation Scale based on the gender variable ($p > 0.05$).

Table 3 t-Test analysis results for the subdimensions of the sport motivation scale based on gender variable

Subdimension	Groups	n	X	Standard Deviation	t	p
Intrinsic Motivation to Know and Accomplish	Female	157	40.33	9.24	1.396	0.164
	Male	190	38.88	9.95		
Intrinsic Motivation to Experience Stimulation	Female	157	18.37	4.69	0.494	0.622
	Male	190	18.12	4.75		
External Regulation	Female	157	16.57	4.83	-0.025	0.980
	Male	190	16.58	5.19		
Introjection	Female	157	17.35	3.98	0.543	0.587
	Male	190	17.11	4.17		
Identification	Female	157	18.57	4.04	1.904	0.058
	Male	190	17.71	4.27		
Amotivation	Female	157	8.79	5.01	-1.904	0.058
	Male	190	9.81	4.94		

Table 4 t-Test analysis results for the subdimensions of the sport imagery questionnaire based on gender variable

Subdimension	Grou	n	X	Standard Deviation	t	p
Cognitive Imagery	Female	157	42.68	10.82	-0.075	0.94
	Male	190	42.76	10.27		
Motivational Specific Imagery	Female	157	22.62	7.08	-0.268	0.789
	Male	190	22.81	6.26		
Motivational General-Arousal	Female	157	15.38	4.30	2.292	0.022*
	Male	190	14.25	4.74		
Motivational General-Mastery	Female	157	13.15	3.51	0.959	0.338
	Male	190	12.79	3.47		

* $p < 0,05$ **Table 5** t-Test analysis results for the subdimensions of the sport motivation scale based on educational background variable

Subdimension	Groups	n	X	StdDeviation	t	p
Intrinsic Motivation to Know and Accomplish	High School	191	37.68	9.18	-4.054	0.000*
	University	156	41.81	9.75		
Intrinsic Motivation to Experience Stimulation	High School	191	17.12	4.60	-5.003	0.000*
	University	156	19.59	4,51		
External Regulation	High School	191	15.23	5.05	-5.796	0.000*
	University	156	18.23	4.48		
Introjection	High School	191	16.27	4.28	-4.915	0.000*
	University	156	18.37	3.51		
Identification	High School	191	17.15	4.26	-4.789	0.000*
	University	156	19.25	3.8		
Amotivation	High School	191	10.26	4.73	3.843	0.000*
	University	156	8.23	5.1		

* $p < 0,001$

Upon examining Table 4, a significant difference was observed in the “Motivational General-Arousal” (MGA) subdimension of the Sport Imagery Questionnaire based on the gender variable ($p < 0.05$). However, no significant differences were found in the “Cognitive Imagery” (CI), “Motivational Specific Imagery” (MSI), or “Motivational General-Mastery” (MGM) subdimensions ($p > 0.05$).

According to Table 5, significant differences were found in all subdimensions of the Sport Motivation Scale based on the educational background variable ($p < 0.05$).

In Table 6, significant differences were observed in the “Cognitive Imagery” (CI), “Motivational Specific

Imagery” (MSI), and “Motivational General-Mastery” (MGM) subdimensions of the Sport Imagery Questionnaire based on the educational background variable ($p < 0.05$). However, no significant difference was found in the “Motivational General-Arousal” (MGA) subdimension ($p > 0.05$).

Upon examining Table 7, significant differences were observed in the subdimensions of the Sport Motivation Scale, including “Intrinsic Motivation to Know and Accomplish” (IM-K), “Intrinsic Motivation to Experience Stimulation” (IM-S), “External Regulation” (ER), “Introjection” (I), and “Identification” (ID), based on the

Table 6 t-Test analysis results for the subdimensions of the sport imagery questionnaire based on educational background variable

Subdimension	Groups	n	X	Standard Deviation	t	p
Cognitive Imagery	High School	191	39.19	9.65	-7.451	0.000*
	University	156	47.05	9.91		
Motivational Specific Imagery	High School	191	20.98	6.34	-5.641	0.000*
	University	156	24.86	6.38		
Motivational General-Arousal	High School	191	14.79	4.91	0.116	0.907
	University	156	14.73	4.15		
Motivational General-Mastery	High School	191	11.93	3.44	-6.386	0.000*
	University	156	14.21	3.12		

* $p < 0.001$ **Table 7** t-Test analysis results for the subdimensions of the sport motivation scale based on National athlete status variable

Subdimension	Groups	n	X	Standard Deviation	t	p
Intrinsic Motivation to Know and Accomplish	Yes	161	40.99	9.54	2.624	0.009*
	No	186	38.28	9.60		
Intrinsic Motivation to Experience Stimulation	Yes	161	19.02	4.46	2.915	0.004*
	No	186	17.55	4.84		
External Regulation	Yes	161	17.76	4.49	4.169	0.000**
	No	186	15.55	5.24		
Introjection	Yes	161	17.92	3.56	3.029	0.003*
	No	186	16.6	4.41		
Identification	Yes	161	18.81	3.68	2.989	0.003*
	No	186	17.48	4.50		
Amotivation	Yes	161	8.87	5.09	-1.664	0.097
	No	186	9.76	4.89		

* $p < 0.05$ ** $p < 0.001$ **Table 8** t-Test analysis results for the subdimensions of the sport imagery questionnaire based on National athlete status variable

Subdimension	Groups	n	X	Standard Deviation	t	p
Cognitive Imagery	Yes	161	47.29	8.41	8.223	0.000**
	No	186	38.77	10.56		
Motivational Specific Imagery	Yes	161	24.2	6.18	3.938	0.000**
	No	186	21.45	6.76		
Motivational General-Arousal	Yes	161	14.42	4.37	-1.306	0.192
	No	186	15.06	4.74		
Motivational General-Mastery	Yes	161	13.6	3.51	3.246	0.001*
	No	186	12.4	3.38		

* $p < 0.05$ ** $p < 0.001$

national athlete status variable ($p < 0.05$). However, no significant differences were found in the “Amotivation” (AM) subdimension ($p > 0.05$).

According to Table 8, significant differences were observed in the subdimensions of the Sport Imagery Questionnaire, including “Cognitive Imagery” (CI), “Motivational Specific Imagery” (MSI), and “Motivational General-Mastery” (MGM), based on the national athlete status variable ($p < 0.05$). However, no significant difference was found in the “Motivational General-Arousal” (MGA) subdimension ($p > 0.05$).

Upon examining Table 9, a significant difference was observed in the “External Regulation” (ER) subdimension

of the Sport Motivation Scale based on the best achievement variable ($p < 0.05$). However, no significant differences were found in the “Intrinsic Motivation to Know and Accomplish” (IM-K), “Intrinsic Motivation to Experience Stimulation” (IM-S), “Introjection” (I), “Identification” (ID), and “Amotivation” (AM) subdimensions ($p > 0.05$). Tukey’s test was used for multiple comparisons within the subdimension where the difference occurred. The results of Tukey’s test revealed that in the “External Regulation” (ER) subdimension, international athletes scored significantly higher than both national and regional athletes.

Table 9 ANOVA analysis results for the subdimensions of the sport motivation scale based on best achievement variable

Subdimension	Source of Variance	Sum of Squares	df	Mean Square	F	p	Significant Difference
Intrinsic Motivation to Know and Accomplish	Between Groups	144.541	2	72.271	0.774	0.462	-
	Within Groups	3210.54	344	93.327			
	Total	32249.082	346				
Intrinsic Motivation to Experience Stimulation	Between Groups	26.999	2	13.499	0.604	0.547	-
	Within Groups	7683.249	344	22.335			
	Total	7710.247	346				
External Regulation	Between Groups	260.181	2	130.091	5.272	0.006*	International > National International > Regional
	Within Groups	8488.853	344	24.677			
	Total	8749.034	346				
Introjection	Between Groups	65.272	2	32.636	1.962	0.142	-
	Within Groups	5721.583	344	16.633			
	Total	5786.854	346				
Identification	Between Groups	90.276	2	45.138	2.594	0.076	-
	Within Groups	5985.114	344	17.399			
	Total	6075.39	346				
Amotivation	Between Groups	81.035	2	40.517	1.627	0.198	-
	Within Groups	8564.595	344	24.897			
	Total	8645.629	346				

* $p < 0.05$ **Table 10** ANOVA analysis results for the subdimensions of the sport imagery questionnaire based on best achievement variable

Subdimension	Source of Variance	Sum of Squares	df	Mean Square	F	p	Significant Difference
Cognitive Imagery	Between Groups	1897.387	2	948.694	8.98	0.000*	International > National International > Regional
	Within Groups	36343.24	344	105.649			
	Total	38240.63	346				
Motivational Specific Imagery	Between Groups	245.931	2	122.966	2.819	0.061	-
	Within Groups	15006.73	344	43.624			
	Total	15252.66	346				
Motivational General-Arousal	Between Groups	363.503	2	181.751	9.06	0.000*	Regional > International Regional > National
	Within Groups	6900.644	344	20.06			
	Total	7264.146	346				
Motivational General-Mastery	Between Groups	7.801	2	3.9	0.319	0.727	-
	Within Groups	4209.909	344	12.238			
	Total	4217.71	346				

* $p < 0.001$

Upon examining Table 10, significant differences were observed in the “Cognitive Imagery” (CI) and “Motivational General-Arousal” (MGA) subdimensions of the Sport Imagery Questionnaire based on the best achievement variable ($p < 0.05$). However, no significant differences were found in the “Motivational Specific Imagery” (MSI) and “Motivational General-Mastery” (MGM) subdimensions ($p > 0.05$). Tukey’s test was used for multiple comparisons within the subdimensions where differences were detected.

The results of the Tukey test indicated that in the “Cognitive Imagery” (CI) subdimension, international athletes scored significantly higher than national and regional athletes. Conversely, in the “Motivational General-Arousal” (MGA) subdimension, regional athletes scored

significantly higher than international and national athletes.

In Table 11, no significant differences were observed across any subdimensions of the Sport Motivation Scale based on the technique variable ($p > 0.05$).

Upon examining Table 12, no significant differences were observed across any subdimensions of the Sport Imagery Questionnaire based on the technique variable ($p > 0.05$).

In Table 13, a low positive correlation was observed between the participants’ age variable and the subdimensions of the Sport Motivation Scale, including “Intrinsic Motivation to Know and Accomplish” (IM-K), “Intrinsic Motivation to Experience Stimulation” (IM-S), “External Regulation” (ER), “Introjection” (I), and “Identification”

Table 11 t-Test analysis results for the subdimensions of the sport motivation scale based on technique variable

Subdimension	Groups	n	X	Standard Deviation	t	p
Intrinsic Motivation to Know and Accomplish	Clean and Jerk	199	39.26	10.23	-0.626	0.532
	Snatch	148	39.91	8.84		
Intrinsic Motivation to Experience Stimulation	Clean and Jerk	199	18.05	5.03	-0.851	0.395
	Snatch	148	18.48	4.26		
External Regulation	Clean and Jerk	199	16.68	4.75	0.456	0.649
	Snatch	148	16.43	5.39		
Introjection	Clean and Jerk	199	17.16	4.19	-0.3	0.764
	Snatch	148	17.29	3.95		
Identification	Clean and Jerk	199	17.88	4.52	-1.105	0.27
	Snatch	148	18.39	3.68		
Amotivation	Clean and Jerk	199	9.31	5.14	-0.179	0.858
	Snatch	148	9.4	4.81		

Table 12 t-Test analysis results for the subdimensions of the sport imagery questionnaire based on technique variable

Subdimension	Groups	n	X	Standard Deviation	t	p
Cognitive Imagery	Clean and Jerk	199	42.4	11.01	-0.671	0.503
	Snatch	148	43.16	9.82		
Motivational Specific Imagery	Clean and Jerk	199	22.23	7.32	-1.616	0.107
	Snatch	148	23.39	5.53		
Motivational General-Arousal	Clean and Jerk	199	15.16	4.54	1.862	0.063
	Snatch	148	14.23	4.59		
Motivational General-Mastery	Clean and Jerk	199	12.65	3.77	-1.883	0.061
	Snatch	148	13.36	3.02		

Table 13 Pearson correlation analysis results for the subdimensions of the sport motivation scale based on age, athletic experience, and weight category variables

Variable		Intrinsic Motivation to Know and Accomplish	Intrinsic Motivation to Experience Stimulation	External Regulation	Introjection	Identification	Amotivation
Age	r	0.142**	0.228**	0.286**	0.238**	0.282**	-0.07
	p	0.008	0	0	0	0	0.191
	n	347	347	347	347	347	347
Athletic Experience	r	0.241**	0.300**	0.356**	0.254**	0.303**	-0.164**
	p	0	0	0	0	0	0.002
	n	347	347	347	347	347	347
Weight Category	r	0.094	0.146**	0.085	0.197**	0.108*	0.068
	p	0.081	0.006	0.115	0	0.045	0.209
	n	347	347	347	347	347	347

* $p < 0.05$; ** $p < 0.001$

(ID) ($p < 0.05$). However, no correlation was found with the “Amotivation” (AM) subdimension ($p > 0.05$).

For the athletic experience variable, a low positive correlation was observed with the “Intrinsic Motivation to Know and Accomplish” (IM-K) and “Introjection” (I) subdimensions ($p < 0.05$); a moderate positive correlation with the “Intrinsic Motivation to Experience Stimulation” (IM-S), “External Regulation” (ER), and “Identification” (ID) subdimensions ($p < 0.05$); and a low negative correlation with the “Amotivation” (AM) subdimension ($p < 0.05$).

For the weight category variable, a low positive correlation was found with the “Intrinsic Motivation to

Experience Stimulation” (IMES), “Introjection” (I), and “Identification” (ID) subdimensions ($p < 0.05$). In contrast, no correlation was observed with the “Intrinsic Motivation to Know and Accomplish” (IMKA), “External Regulation” (ER), and “Motivation” (M) subdimensions ($p > 0.05$).

According to Table 14, a moderate positive correlation was found between the participants’ age variable and the “Cognitive Imagery” (CI) subdimension of the Sport Imagery Questionnaire ($p < 0.05$). Additionally, low positive correlations were observed with the “Motivational Specific Imagery” (MSI) and “Motivational General-Mastery” (MGM) subdimensions ($p < 0.05$). However, no

Table 14 Pearson correlation analysis results for the subdimensions of the sport imagery questionnaire based on age, athletic experience, and weight category variables

Variable		Cognitive Imagery	Motivational Specific Imagery	Motivational General-Arousal	Motivational General-Mastery
Age	r	0.380**	0.221**	−0.057	0.237**
	p	0	0	0.293	0
	n	347	347	347	347
Athletic Experience	r	0.474**	0.349**	−0.078	0.307**
	p	0	0	0.148	0
	n	347	347	347	347
Weight Category	r	0.049	0.125*	−0.046	0.122*
	p	0.358	0.02	0.39	0.023
	n	347	347	347	347

* $p < 0.05$; ** $p < 0.001$ **Table 15** Pearson correlation analysis results between the subdimensions of the sport imagery questionnaire and the sport motivation scale

		Intrinsic Motivation to Know and Accomplish	Intrinsic Motivation to Experience Stimulation	External Regulation	Introjection	Identification	Amotivation
Cognitive Imagery	r	0.773**	0.723**	0.582**	0.639**	0.613**	−0.207**
	p	0	0	0	0	0	0
	n	347	347	347	347	347	347
Motivational Specific Imagery	r	0.781**	0.784**	0.625**	0.661**	0.658**	−0.163**
	p	0	0	0	0	0	0.002
	n	347	347	347	347	347	347
Motivational General-Arousal	r	0.432**	0.371**	0.288**	0.411**	0.283**	0.153**
	p	0	0	0	0	0	0.004
	n	347	347	347	347	347	347
Motivational General-Mastery	r	0.757**	0.736**	0.550**	0.639**	0.617**	−0.314**
	p	0	0	0	0	0	0
	n	347	347	347	347	347	347

** $p < 0.001$

correlation was found with the “Motivational General-Arousal” (MGA) subdimension ($p > 0.05$).

For the athletic experience variable, moderate positive correlations were found with the “Cognitive Imagery” (CI), “Motivational Specific Imagery” (MSI), and “Motivational General-Mastery” (MGM) subdimensions ($p < 0.05$). No significant correlation was observed with the “Motivational General-Arousal” (MGA) subdimension ($p > 0.05$).

Regarding the weight category variable, low positive correlations were observed with the “Motivational Specific Imagery” (MSI) and “Motivational General-Mastery” (MGM) subdimensions ($p < 0.05$). However, no correlations were found with the “Cognitive Imagery” (CI) and “Motivational General-Arousal” (MGA) subdimensions ($p > 0.05$).

Upon examining Table 15, a strong positive correlation was observed between the “Cognitive Imagery” (CI) subdimension of the Sport Imagery Questionnaire and the “Intrinsic Motivation to Know and Accomplish” (IM-K) and “Intrinsic Motivation to Experience Stimulation” (IM-S) subdimensions of the Sport Motivation Scale

($p < 0.05$). Additionally, a moderate positive correlation was found with the “External Regulation” (ER), “Introjection” (I), and “Identification” (ID) subdimensions ($p < 0.05$). In contrast, a weak negative correlation was observed with the “Amotivation” (AM) subdimension ($p < 0.05$).

For the “Motivational Specific Imagery” (MSI) subdimension of the Sport Imagery Questionnaire, a strong positive correlation was identified with the “Intrinsic Motivation to Know and Accomplish” (IM-K) and “Intrinsic Motivation to Experience Stimulation” (IM-S) subdimensions ($p < 0.05$). A moderate positive correlation was observed with the “External Regulation” (ER), “Introjection” (I), and “Identification” (ID) subdimensions ($p < 0.05$). In contrast, a weak negative correlation was found with the “Amotivation” (AM) subdimension ($p < 0.05$).

For the “Motivational General-Arousal” (MGA) subdimension of the Sport Imagery Questionnaire, a moderate positive correlation was found with the “Intrinsic Motivation to Know and Accomplish” (IM-K), “Intrinsic Motivation to Experience Stimulation” (IM-S), and

“Introjection” (I) subdimensions ($p < 0.05$). Additionally, a weak positive correlation was observed with the “External Regulation” (ER) and “Identification” (ID) subdimensions ($p < 0.05$), as well as a weak positive correlation with the “Amotivation” (AM) subdimension ($p < 0.05$).

For the “Motivational General-Mastery” (MGM) subdimension of the Sport Imagery Questionnaire, a strong positive correlation was identified with the “Intrinsic Motivation to Know and Accomplish” (IM-K) and “Intrinsic Motivation to Experience Stimulation” (IM-S) subdimensions ($p < 0.05$). A moderate positive correlation was observed with the “External Regulation” (ER), “Introjection” (I), and “Identification” (ID) subdimensions ($p < 0.05$). In contrast, a moderate negative correlation was found with the “Amotivation” (AM) subdimension ($p < 0.05$).

Discussion

This study examined the relationship between weightlifters’ use of imagery and their motivational sources. The data collected for this purpose were analyzed in this section within the existing literature.

No significant differences were found across the Sport Motivation Scale subdimensions regarding the gender variable. Supporting this finding, Ağduman [18] reported no variation in extrinsic motivation levels based on gender among the study group. Similarly, Yıldırım [10] found no differences in the levels of “Amotivation” (AM), “Intrinsic Motivation to Experience Stimulation” (IMES), “External Regulation” (ER), and “Identification” (ID) about the gender variable [10, 18]. Akman and Can [19] also identified no significant differences in “External Regulation” (ER) and “Amotivation” (AM) levels across genders in their study group [19].

Simeonidou [27] found significant differences in “External Regulation” (ER) and “Identification” (ID) levels based on gender [20]. Turkey and Sökmen [21] similarly observed differences in “External Regulation” (ER) levels in their study group [21]. Additionally, Demir [11] reported significant differences in “External Regulation” (ER) levels based on gender [11]. Olmuş et al. [22] found significant differences in the levels of “Intrinsic Motivation to Know and Accomplish” (IM-K), “Intrinsic Motivation to Experience Stimulation” (IM-S), “External Regulation” (ER), “Introjection” (I), “Identification” (ID), and “Motivation” (M) in their sample group based on the gender variable [22]. A general review of the literature reveals that gender is a significant factor influencing variations in motivation [77, 78].

In light of these findings, it can be concluded that gender is not a determining factor in the motivation levels of athletes involved in weightlifting. This may be attributed to the universal nature of gender and the similar socialization tendencies exhibited by athletes in this field.

Significant differences were observed in the “Motivational General-Arousal” (MGA) subdimension of the Sport Imagery Questionnaire based on the gender variable. In contrast, no significant differences were found in the “Cognitive Imagery” (CI), “Motivational Specific Imagery” (MSI), or “Motivational General-Mastery” (MGM) subdimensions. Supporting this finding, Yarıyan and Ayan [23] reported that their study group’s “MGA” levels differed significantly based on gender [23]. Similarly, Bozdağ and Ergin [24] found no significant differences in “CI,” “MSI,” and “MGM” levels across genders in their study. Likewise, Doğan [25] observed no variation in the “CI,” “MSI,” and “MGM” subdimensions based on the gender variable [24, 25].

On the other hand, Di Corrado et al. [26] identified significant differences in the “Cognitive Imagery” (CI) subdimension concerning gender [26]. Erdem [27] found that the “MGA” subdimension levels showed significant differences favouring female participants [27]. Kumartaşlı et al. [28] also reported significant differences in the “Cognitive Imagery” (CI) subdimension based on gender [28]. Furthermore, Arslangörür [29] observed differences in the “CI,” “MSI,” and “MGM” subdimensions in their study group based on gender [29]. These results are in agreement with studies indicating that male and female athletes may adopt distinct mental imagery strategies [79, 80].

These findings suggest that weightlifters benefit from positive emotions such as confidence and motivation when preparing for significant competitions. Moreover, the higher emotional intensity observed among female participants, as reflected in average scores, indicates that women may utilize these positive emotions more effectively.

This finding is consistent with various studies supporting the impact of educational level on motivation [81, 82]. Significant differences were found across the Sport Motivation Scale subdimensions based on the participants’ educational background variable. Supporting this finding, Elsborg and Elbe [30] reported that the “External Regulation” (ER) subdimension varied significantly based on the educational background of their study group [30]. Similarly, Gül [31] observed significant differences in the “External Regulation” (ER) and “Identification” (ID) subdimensions regarding education level [31]. Sezgin [32] also identified differences in the “Identification” (ID), “Introjection” (I), and “Motivation” (AM) subdimensions based on educational background [32].

Yetiş, Servi, and Karabağ [33] further found significant differences in the “Intrinsic Motivation to Know and Accomplish” (IMKA), “Intrinsic Motivation to Experience Stimulation” (IM-S), “Introjection” (I), and “Identification” (ID) subdimensions based on education level [33]. On the other hand, İmamoğlu Kaya, Çiçek,

and Imamoğlu [34] found no significant differences in the “IM-K,” “IM-S,” “ER,” “ID,” “I,” and “AM” subdimensions in their study [34]. Similarly, Yazıcı and Maçça [35] observed no significant differences in the “ID,” “Introjection,” “ER,” and “Amotivation” subdimensions based on education level [35]. Serin [36] also reported no significant variation in the “ER” subdimension regarding educational background [36].

These findings suggest that as weightlifters’ educational levels increase, their awareness levels also improve, which is positively reflected in their motivation levels. This is further supported by the observation that scores favour individuals with university-level education.

Significant differences were found in the “Cognitive Imagery” (CI), “Motivational Specific Imagery” (MSI), and “Motivational General-Mastery” (MGM) subdimensions of the Sport Imagery Questionnaire based on the participants’ educational background. In contrast, no significant differences were observed in the “Motivational General-Arousal” (MGA) subdimension. Supporting this finding, Raiola et al. [37] identified significant differences in the “MSI” subdimension based on educational background [37]. Şahin [38] found differences in the “CI” subdimension related to educational background [38]. Savaş [39] detected significant differences in the “CI” and “MGM” subdimensions based on educational background [39]. Bayrak Ayaş [40] reported differences in the “CI,” “MGM,” and “MSI” subdimensions concerning educational background [40]. On the other hand, Çil [41] found differences in the “MGA” subdimension about educational background [41]. These findings are consistent with studies emphasizing the influence of educational background on the development of sport psychology and imagery skills [83, 84]. Demir [11] found no significant differences in the “CI,” “MSI,” and “MGM” subdimensions based on educational background [11]. Similarly, Güler [42] also found no significant differences in the “CI,” “MSI,” and “MGM” subdimensions about educational background [42].

In light of these findings, it can be concluded that weightlifters with higher education levels tend to have higher perceptions and are more likely to benefit from mental training.

Significant differences were found in the “Intrinsic Motivation to Know and Accomplish” (IMKA), “Intrinsic Motivation to Experience Stimulation” (IMES), “External Regulation” (ER), “Introjection” (I), and “Identification” (ID) subdimensions of the Sport Motivation Scale based on the participants’ national status. In contrast, no significant difference was observed in the “Amotivation” (AM) subdimension. Additionally, about the participants’ best performance level, a significant difference was found in the “External Regulation” (ER) subdimension. In contrast, no significant differences were observed in the “IM-K,”

“IM-S,” “Introjection” (I), “ID,” and “AM” subdimensions. Tukey’s post-hoc test was used for multiple comparisons in the subdimension where a significant difference was found. The results of the Tukey test revealed that in the “ER” subdimension, the international group showed significantly higher scores than the national group, and the international group also had higher scores than the regional group.

Supporting these findings, Lupo et al. [43] identified significant differences in the “ER” subdimension based on national status [43]. Özaslan [44] reported differences in the “IM-K” and “ER” subdimensions based on national status [44]. Gül [31] found that, in the context of athletes’ national status, the motivation levels for external regulation, identification, and external motivation were significant, with national athletes demonstrating higher motivation levels overall [31]. Pulat [45] reached similar conclusions, noting that national athletes scored higher than non-national athletes [45].

On the other hand, Satılmış [46] found no significant differences in the “ID,” “I,” or “ER” subdimensions based on national status, though a significant difference was observed in the “AM” subdimension [46]. This suggests that national athletes face more challenges due to their participation in national and international competitions, face more challenges, and this increased difficulty may motivate them to utilize motivational sources more effectively to achieve their best performance.

The questionnaire was based on the participants’ national status, while no significant differences were observed in the “Motivational General-Arousal” (MGA) subdimension. In terms of the participants’ best performance level, significant differences were found in the “CI” and “MGA” subdimensions. In contrast, no significant differences were observed in the “MSI” and “MGM” subdimensions. Tukey’s post-hoc test was used for multiple comparisons in the subdimensions where significant differences were found. The results of the Tukey test showed that in the “CI” subdimension, international athletes scored significantly higher than national athletes, and international athletes also had higher scores than regional athletes. In the “MGA” subdimension, regional athletes scored significantly higher than international and national athletes.

Gregg and Hall [47] supported these findings and identified a significant difference in the “CI” subdimension based on national status [47]. Erdoğan and Erhan [48] found differences in the “CI,” “MSI,” and “MGM” subdimensions based on national status [48]. Cankurtaran [49] identified significant differences in the “CI,” “MSI,” and “MGM” subdimensions based on national status but found no difference in the “MGA” subdimension, which aligns with the results of our study [49]. Similarly, Öner [50] identified that the nationality status variable also

creates significant differences in the dimensions of performance and managerial competence [50]. Savaş [39] observed a difference in the “CI” subdimension based on national status [39]. On the other hand, Özmutlu [51] found no significant differences in the “CI” and “MSI” subdimensions based on national status [51]. Güvendi [52] found no significant differences in the “CI,” “MSI,” or “MGM” subdimensions based on national status [52]. Similarly, Bozlar [53] found no differences in the “CI,” “MGM,” or “MSI” subdimensions based on national status [53].

In this context, due to their experience in national and international competitions, national athletes benefit from their experiences in mental training, enhancing their ability to achieve their best performance in upcoming competitions.

No significant differences in the Sport Motivation Scale subdimensions concerning the participants’ technical variable were found. Additionally, a low-level positive relationship was found between the participants’ weight class variable and the “IM-S,” “I,” and “ID” subdimensions of the Sport Motivation Scale. In contrast, no relationship was observed in the “IM-K,” “ER,” and “AM” subdimensions. In a study by Piepiora et al. [54], differences were found in the “ER” and “ID” subdimensions based on the technical variable, while no differences were observed in the “I” subdimension [54]. Supporting our findings, Özaslan [44] stated that motivation is a complex concept that is difficult to conceptualize and measure, especially from an observational perspective [44]. This complexity is also frequently encountered in sports. In the context of weightlifting, which is the focus of our study, both the challenges inherent in the sport and the two techniques, snatch and clean & jerk, present difficulties. According to Başandaç [55], strength and speed dominate equally in weightlifting [55]. Thus, weightlifting, as a sport, requires a combination of endurance and strength, making it a functional sport. Weightlifting is one of the few sports where all four biomotor qualities—strength, speed, endurance, and power—are activated together. Weightlifters are among the strongest athletes in general, and this sport, being a weight-class sport, means that the difficulty of snatch and clean and jerk movements increases as the weight class increases.

Consequently, heavy weightlifters face more significant challenges in terms of both motivation and technique. In summary, as the weight class increases, the weight lifted also increases, requiring athletes to exert more effort to stay motivated. However, since all athletes compete in both the snatch and clean and jerk techniques, no significant differences are expected regarding the technical variable in our sample group.

No significant differences in the Sport Imagery Inventory subdimensions concerning the participants’

technical variables were found. Additionally, a low-level positive correlation was found between the participants’ weight class variable and the “MSI” and “MGM” subdimensions of the Sport Imagery Inventory. At the same time, no relationship was observed in the “CI” and “MGA” subdimensions. In a study conducted by Silbernagel, Short, and Ross-Stewart [56], significant differences were found in the “MSI” subdimension based on the technical variable, while no differences were observed in the “MGA” subdimension [56]. Supporting our findings, athletes encounter various challenges during competition due to internal and external factors. These challenges can be overcome through strategies learned from past experiences [57]. One of these strategies is imagery. Imagery is a commonly used technique to cope with difficulties. In the context of our study, which focuses on weightlifting, athletes can overcome the challenges of the snatch and clean and jerk techniques by using imagery. Weightlifters can improve their technique not only through physical training but also through mental training. Considering that weightlifting is a weight-class sport, as the weight class increases, the amount of weight lifted also increases, which in turn leads to a greater use of imagery. Therefore, as weightlifters compete in higher weight classes, the amount of weight they must lift increases, and as a result, heavy weightlifters benefit more from imagery. For example, a weightlifter in the 67 kg category faces a weight load different from that in the 109 kg category, requiring more mental preparation due to the increased weight. However, since all athletes compete in both the snatch and clean jerk techniques, no significant differences are expected regarding the technical variable in our sample group.

A positive, low-level relationship was found between the participants’ age variable and the subdimensions of the Sport Motivation Scale, namely “IM-K,” “IM-S,” “ER,” “I,” and “ID,” while no relationship was observed with the “AM” subdimension. In support of our findings, De Pero et al. [58] identified a significant difference in the “IM-K” and “IM-S” levels concerning the age variable [58]. Yıldırım [59] found differences in the “ER” and “I” levels based on age [59]. Güler and Erhan [42] also identified a significant difference in the “I” level concerning age [42]. İslam [60] found that their sample group’s “ID” level varied with age [60]. On the other hand, İmamoğlu Kaya [61] found no significant differences in the “IM-K,” “IM-S,” “ER,” “I,” and “AM” levels based on age [61]. Ersöz et al. [62] also found no differences in the “IM-K,” “IM-S,” “ER,” and “ID” levels according to age in their study [62]. Similarly, Serin [36] did not find significant differences in the “IM-K,” “IM-S,” “ER,” “I,” and “ID” levels based on age [36]. In this context, it is thought that as weightlifters’ age levels increase, their experiences, sports goals, perceptions, and awareness also increase positively, enabling

them to use motivational resources more effectively. A literature review on age as a variable reveals that younger athletes tend to be more driven by extrinsic motivation. In contrast, intrinsic motivation becomes more prominent with increasing age. It is noted that older athletes are more likely to develop intrinsic motivation by focusing on long-term goals and personal development [85, 86].

A positive, low-level relationship was found between participants' sports age and the subdimensions of the Sport Motivation Scale, namely "IM-K" and "I," while a positive, moderate-level relationship was observed between "IM-S," "ER," and "ID." A negative, low-level relationship was found with the "AM" subdimension. In support of these findings, Reshetnikov et al. [63] identified differences in the "IM-S," "I," and "ID" levels based on sports age in their sample group [63]. Kesler [64] also observed differences in the "IM-K," "IM-S," "I," and "ID" levels about the sport age variable [64]. Polat, Doğan, and Mutlu [65] reported a negative relationship with the "AM" level about sports age [65]. On the other hand, Atasoy and Ekiz [66] found no significant differences in the "ID," "I," and "ER" levels based on sports age, while a positive relationship was identified with the "AM" level [66]. Özen [67] did not find significant differences in the "IM-K," "ER," "IA," "ID," and "AM" levels based on sports age in their study [67]. These findings suggest that as athletes' sports age increases, their experience, knowledge, skills, and other factors improve, positively influencing their motivation levels and decreasing "AM" levels, thus supporting them in their training.

A moderate positive correlation was found between the participants' age variable and the "Cognitive Imagery" (CI) subdimension of the Sport Imagery Questionnaire. In contrast, a low positive correlation was observed with the "Motivational Specific Imagery" (MSI) and "Motivational General-Mastery" (MGM) subdimensions. In their study, Parker et al. [87] stated that age is a significant factor influencing imagery skills in sport [87]. However, no significant correlation was identified with the "Motivational General-Arousal" (MGA) subdimension.

Supporting our findings, Aqil [68] reported significant differences in the "Cognitive Imagery" (CI) and "Motivational Specific Imagery" (MSI) subdimensions based on age [68]. Similarly, Demir [11] found significant differences in the "Cognitive Imagery" (CI) and "Motivational General-Mastery" (MGM) subdimensions about age [11]. Kaya and Günay [69] also identified significant differences in the "Cognitive Imagery" (CI) subdimension, while Şahinler [70] found significant differences in the "Motivational general mastery" (MGM) subdimension based on age [69, 70]. Conversely, Erdem [27] reported significant differences in the "Motivational General-Arousal" (MGA) subdimension concerning age [27].

On the other hand, Yaran and Ayan [23] found no significant differences in the "Cognitive Imagery" (CI), "Motivational Specific Imagery" (MSI), or "Motivational General-Mastery" (MGM) subdimensions based on age [23]. Similarly, Kartal et al. [71] observed no significant differences in these subdimensions concerning age [71].

These findings suggest that as participants' average age increases, so does their ability to mentally conceptualize and execute technical skills, demonstrating an improvement in this capability over time.

A moderate positive correlation was found between participants' athletic experience and the "Cognitive Imagery" (CI), "Motivational Specific Imagery" (MSI), and "Motivational General-Mastery" (MGM) subdimensions of the Sport Imagery Questionnaire. However, no correlation was observed with the "Motivational General-Arousal" (MGA) subdimension.

Supporting our findings, Semidara [72] identified significant differences in the "Cognitive Imagery" (CI) and "Motivational Specific Imagery" (MSI) subdimensions based on athletic experience [72]. Similarly, Arslangörür (2022) reported differences in the "CI," "MSI," and "MGM" subdimensions about the athletic experience [29]. Yamak [73] also found significant differences in the "MSI" subdimension based on athletic experience [73]. In another study, Kumartaşlı et al. [28] observed significant differences in the "CI," "MSI," and "MGM" subdimensions, further supporting these results [28].

Conversely, Türkçapar [74] reported no significant differences in the "CI," "MSI," and "MGM" subdimensions based on athletic experience [74]. Similarly, Kul et al. [75] found no significant differences in these subdimensions in their study group [75].

These findings suggest that as individuals gain more athletic experience, their skills, awareness, and other capabilities improve. This development is reflected in the increasing levels of "Cognitive Imagery," "Motivational Specific Imagery," and "Motivational General-Mastery."

A strong positive correlation was found between the "Cognitive Imagery" (CI) subdimension of the Sport Imagery Questionnaire and the "Intrinsic Motivation to Know" (IM-K) and "Intrinsic Motivation to Experience Stimulation" (IM-S) subdimensions of the Sport Motivation Scale. A moderate positive correlation was observed with the "External Regulation" (ER), "Introjection" (I), and "Identification" (ID) subdimensions, while a weak negative correlation was found with the "Amotivation" (AM) subdimension. In this context, as weightlifters' "CI" levels increase, their "IM-K," "IM-S," "ER," "I," and "ID" levels also rise, while their "AM" levels decrease.

A strong positive correlation was found between the "Motivational Specific Imagery" (MSI) subdimension of the Sport Imagery Questionnaire and the "IM-K" and "IM-S" subdimensions of the Sport Motivation Scale.

A moderate positive correlation was observed with the “ER,” “I,” and “ID” subdimensions, while a weak negative correlation was found with the “AM” subdimension. In this context, as weightlifters’ “MSI” levels increase, their “IM-K,” “IM-S,” “ER,” “I,” and “ID” levels also rise, while their “AM” levels decrease.

A moderate positive correlation was found between the “Motivational General-Arousal” (MGA) subdimension of the Sport Imagery Questionnaire and the “IM-K,” “IM-S,” and “I” subdimensions of the Sport Motivation Scale. A weak positive correlation was observed with the “ER” and “ID” subdimensions, while a weak positive correlation was found with the “AM” subdimension. In this context, as weightlifters’ “MGA” levels increase, their “IM-K,” “IM-S,” “I,” “ER,” “ID,” and “AM” levels also increase.

A strong positive correlation was found between the “Motivational General-Mastery” (MGM) subdimension of the Sport Imagery Questionnaire and the “IM-K” and “IM-S” subdimensions of the Sport Motivation Scale. A moderate positive correlation was observed with the “ER,” “I,” and “ID” subdimensions, while a moderate negative correlation was found with the “AM” subdimension. In this context, as weightlifters’ “MGM” levels increase, their “IM-K,” “IM-S,” “ER,” “I,” and “ID” levels also rise, while their “AM” levels decrease.

Supporting our findings, Kolayis, Sarı, and Köle [76] conducted a study examining the relationship between the Sport Imagery Questionnaire and the Sport Motivation Scale scores [76]. The results of their study indicated a statistically significant relationship between “Cognitive Imagery” (CI) and the intrinsic motivation subdimensions. They noted that athletes with higher cognitive imagery scores also tended to have higher levels of intrinsic motivation.

In another study conducted by Atasoy and Ekiz [66], the relationship between the Sport Imagery Questionnaire and the Sport Motivation Scale scores was investigated [66]. Upon analyzing the results, they performed a Spearman-Brown correlation analysis to determine whether there were significant differences in the relationship between these variables. The analysis revealed a significant positive relationship between imagery and motivation scores. Additionally, they suggested that athletes in football, as a sport, might experience an increase in motivation scores as their imagery scores rise.

When examining the relationship between athletic experience and the subdimensions, the study found a significant positive correlation between the imagery variable and “Cognitive Imagery” (CI), “Motivational General-Arousal” (MGA), and “Motivational General-Mastery” (MGM). Accordingly, as athletic experience increases, the imagery variables, mainly “CI,” “MGA,” and “MGM,” also increase.

In a study by Satılmış [46], the relationship between the Sport Imagery Questionnaire and the Sport Motivation Scale scores was investigated [46]. The results indicated a positive relationship between the “Cognitive Imagery” (CI) subdimension and “Intrinsic Motivation,” “Identified Regulation” (ID), and “Introjection” (I). In contrast, a negative relationship was observed with the “Amotivation” (AM) subdimension. The “Motivational Specific Imagery” (MSI) subdimension showed a positive relationship with “Intrinsic Motivation,” “Identified Regulation” (ID), “Introjection” (I), and “Motivation” (AM) subdimensions. Additionally, the “Motivational General-Arousal” (MGA) subdimension was positively correlated with “Intrinsic Motivation,” “Identified Regulation,” “Introjection,” and “External Regulation” (ER). Finally, the “Motivational General-Mastery” (MGM) subdimension showed a positive significant correlation with “Intrinsic Motivation,” “Identified Regulation,” and “Introjection.”

Based on these findings, weightlifters can use imagery to enhance their motivation levels while continuing their training to pursue their desired goals.

Limitations of the study and recommendations for future research

This study was limited to licensed athletes aged 18–23 who participated in the 2022 Youth and U-23 Turkish Weightlifting Championship in Van. Therefore, the results can only be generalized to athletes within this age group, and results for other age groups cannot be provided. Additionally, the study focused solely on weightlifters, making comparing motivation and imagery use with athletes from other sports disciplines challenging. Future research could expand by including athletes from different age groups. Moreover, conducting comparative studies with athletes from various sports disciplines could provide a more comprehensive understanding of the relationship between motivation sources and imagery use. Furthermore, longitudinal studies would be beneficial in observing changes in athletes’ use of imagery and motivation levels over time. Additionally, enriching the analytical methods used in the study with different approaches could enhance the reliability of the findings.

Conclusion

This study aimed to examine the relationship between the use of imagery and sources of motivation among weightlifters. The results revealed a significant positive relationship between imagery use and motivation levels. Specifically, cognitive imagery (CI), motivational specific imagery (MSI), motivational general mastery (MGM), and motivational general arousal (MGA) subdimensions were strongly positively correlated with motivation. These findings suggest that weightlifters can enhance

their performance through mental training, using imagery as a tool to effectively utilize motivation sources.

The study also explored the influence of variables such as gender, education, and nationality on imagery use and motivation levels among weightlifters. It was found that gender did not significantly impact imagery use or motivation, though female athletes seemed to use positive emotions more effectively, likely due to their more intense emotional levels. Regarding education, athletes with higher educational backgrounds exhibited better perceptions and greater awareness of mental training, which in turn positively affected their motivation levels. Nationality also played a role, with national athletes drawing on their international and national competition experiences, using these challenges to further engage their motivation sources and boost their performance.

Technical and weight class variables also emerged as significant factors affecting the relationship between imagery use and motivation. As weightlifters increase the weights they lift, the use of imagery also increases. Additionally, longer experience and a greater sports age were associated with enhanced imagery use, indicating that experienced athletes tend to make better use of mental training to overcome technical challenges.

In conclusion, the study emphasizes that imagery is a vital tool for weightlifters to enhance performance and manage motivation. Future research could expand on this by exploring a wider range of athletes across various sports and age groups, examining how they can better utilize mental training techniques. Moreover, long-term studies would provide valuable insights into how the use of imagery and motivation levels evolve over time.

Abbreviations

SPSS	Statistical Package for the Social Sciences
%	Percentage
SIQ	Sport Imagery Questionnaire
CI	Cognitive Imagery
MSI	Motivational Specific Imagery
p	Significance Level
MGA	Motivational general arousal
r	Correlation Coefficient
MGM	Motivational general mastery
SMS	The Sports Motivation Scale
SD	Standard Deviation
IM-K	Intrinsic Motivation to Know
t	t-Test Value
IM-A	Intrinsic Motivation to Accomplish
IM-S	Intrinsic Motivation to Experience Stimulation
ER	External Regulation
I	Introjection
ID	Identification
X	Mean
AM	Amotivation

Acknowledgements

This study is derived from the master's thesis titled "Investigation of the Relationship Between Imagery Use Conditions and the Sources of Motivation of Weightlifters" prepared by Ebu Bekir Siddık AKSOY under the supervision of Mehmet Ali CEYHAN and submitted on May 15, 2023.

Author contributions

Study Conception and Design: E.B.S.A., M.A.C.; Data Acquisition, Analysis, or Interpretation of Data: E.B.S.A., M.A.C.; Drafting the Manuscript: E.B.S.A., M.A.C. All authors critically reviewed the manuscript for significant intellectual content. Senior Authorship: M.A.C. All authors approved the final version of the manuscript.

Funding

This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request. The dataset will be accessible only for academic purposes, and any use of the data will recognize the original study and maintain the confidentiality of the participants.

Declarations

Ethics approval and consent to participate

The research was conducted with the knowledge and approval of the school administration. The study was carried out in accordance with the Declaration of Helsinki and applicable local guidelines and regulations. Ethical approval was obtained from the Faculty Ethics Committee of the Bayburt University Rectorate, Bayburt University, with the decision number 26.11.2022–104615, dated 25.11.2022 documented in the 2022/293 Bayburt University Rectorate Ethics Committee Decisions. The participants in this study voluntarily participated of their own accord. Informed consent was obtained from all participants. All methods were carried out in accordance with the relevant guidelines and regulations.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Received: 23 November 2024 / Accepted: 18 July 2025

Published online: 23 October 2025

References

- Rieger M, Massen C. Tool characteristics in imagery of tool actions. *Psychol Res*. 2014;78:10–7.
- Türkiye Milli Olimpiyat Komitesi. Olimpiyat Madalyalarımız. <https://www.olimpiyatkomitesi.org.tr/Olimpiyat-Madalyalarimiz/> (Erişim Tarihi: 18.01.2023).
- Heydari A, Soltani H, Mohammadi-Nezhad M. The effect of Psychological skills training (goal setting, positive selftalk and Imagery) on self-confidence of adolescent volleyball players. *Pedagogics, Psychology, Medical-Biological Problems of Physical Training and Sports*. 2018;4(4):189–194.
- Weinberg R. Does imagery work? Effects on performance and mental skills. *J Imag Res Sport Phys Activity*. 2008;3(1).
- Wraga M, Kosslyn S. Imagery. In: Nadel L, editor. *Encyclopedia of cognitive science*. Volume 2. London: Nature Group; 2002.
- Taştan A. Sporda güdülenme, öz yeterlik ve spora yönelik tutum arasındaki ilişkinin modellenmesi. (Doktora Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 641873). 2020.
- Sipahi Z. Genç futbolculara Uygulanan on Haftalık Bilinçli Farkındalık Eğitim programının sporda Güdülenme ve Bilinçli Farkındalık Üzerindeki etkisi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez 684792). 2021.
- Yeltepe H. Egzersiz Psikolojisi ve Zihinsel Sağlık. Nobel Akademik Yayıncılık; 2011.
- Coleman R, Barries G. Yöneticinin kılavuzu. (Çev. Harmancı M). İstanbul: Remzi Kitabevi; 2000.
- Yıldırım P. Ortaokul öğrencilerinin yaptıkları spor branşlarına göre spora güdülenme düzeylerinin karşılaştırılması. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 471444). 2017.

11. Demir H. Güreşçilerde müsabaka öncesi imgeleme düzeyinin durum-luk kaygıya etkisi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 622786). 2020.
12. Duda J. Goal perspectives and behavior in sport and exercise settings. *Advances in motivation and achievement*. Jai; 1989. pp. 81–115.
13. García-Valverde A, Manresa-Rocamora A, Hernández-Davó JL, Sabido R. Effect of weightlifting training on jumping ability, sprinting performance and squat strength: A systematic review and meta-analysis. *Int J Sports Sci Coach*. 2022;17(4):917–39.
14. Garhammer J, Takano B. Training for weightlifting. *Strength and Power in Sport*. 1992;2.
15. Karayol M, Eroğlu SY. Beden Eğitimi ve spor öğretmenlerinin Mesleki Etik ve Mesleki motivasyon Durumlarının incelenmesi: Muş İli örneği. *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi*. 2020;8(2):655–64.
16. Kızıldağ E. Farklı spor branşındaki sporcuların imgeleme biçimleri. [Yüksek Lisans Tezi]. Yükseköğretim Kurulu Ulusal Tez Merkezi; 2007. (Tez No. 195555). 2007.
17. Kazak Z. Sporda Güdülleme Ölçeğinin Türk sporcuları İçin Güvenirlik ve Geçerlik Çalışması. *Hacettepe Üniversitesi Spor Bilimleri Dergisi*. 2004;15(4):191–206.
18. Ağduman F. Antrenör sporcu ilişkisi ve kişilik özelliklerinin kış sporlarında motivasyona etkisi. (Doktora Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 517782). 2018.
19. Akman K, Can HC. Oryantiring sporu Yapan lise öğrencilerinin sporda Güdülleme Düzeylerinin Farklı değişkenler Açısından incelenmesi. *İnönü Üniversitesi Beden Eğitimi Ve Spor Bilimleri Dergisi*. 2017;6(3):12–21.
20. Simeonidou S. Differences in motivation among female athletes that participate in 'masculine', 'feminine' and 'gender-neutral' sports. 2017.
21. Turkey H, Sökmen T. Beden Eğitimi ve spor Bölümü öğrencilerinin sporda Güdülleme Kaynakları ve stresle Başa Çıkma Tarzları. *İnönü Üniversitesi Beden Eğitimi Ve Spor Bilimleri Dergisi*. 2014;1(3):1–9.
22. Olmuş L, Sanioğlu A, Budak H, Büyükepekçi S. Masajın Judocularda Güdüllemeye etkisi. *Kilis 7 Aralık Üniversitesi Beden Eğitimi. Ve Spor Bilimleri Dergisi*. 2019;3(2):16–21.
23. Yarıyan YE, Ayan S. Farklı Takım Sporlarında Olan sporcuların Imgeleme biçimlerinin incelenmesi. *J Int Social Res*. 2018;11(60).
24. Bozdağ B, Ergin M. Spor bilimleri fakültesi öğrencilerinin Imgeleme Kullanım Düzeylerinin incelenmesi. *Beden Eğitimi Ve Spor Bilimleri Dergisi*. 2021;23(1):82–93.
25. Doğan E. Kadın ve Erkek sporcuların Imgeleme biçimlerinin Karşılaştırılması. *Gaziantep Üniversitesi Spor Bilimleri Dergisi*. 2019;4(3):373–81.
26. Di Corrado D, Guarnera M, Vitali F, Quartiroli A, Coco M. Imagery ability of elite level athletes from individual vs. team and contact vs. no-contact sports. *Peer J*. 2019;7:69–40.
27. Erdem A. Farklı bireysel spor branşlarındaki sporcuların imgeleme biçimlerinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 666621). 2021.
28. Kumartaşlı M, Gülen Ö, Serçe B, Madak E, Bakır Ş. Farklı Branşlardaki sporcuların çeşitli değişkenlere Göre Imgeleme biçimlerinin incelenmesi. *Uluslararası Güncel Eğitim. Araştırmaları Dergisi*. 2021;7(1):136–46.
29. Arslangörür A. Voleybol sporcularında Imgeleme ve sportif Güven Arasındaki İlişkinin incelenmesi. [Yüksek Lisans Tezi]. Yükseköğretim Kurulu Ulusal Tez Merkezi; 2022. (Tez No. 744322).
30. Elsborg P, Elbe AM. Exercise-specific volition and motivation for weight loss maintenance following an intensive lifestyle intervention. *Health Psychol*. 2018;37(8):759.
31. Gül E. Kadın sporcuların güdülme ve mental iyi oluş düzeyleri ile sportif yeterlik ilişkisi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 789295). 2023.
32. Sezgin İ. Sporcularda duygusal zekâ ile motivasyon arasındaki ilişkisinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 743518). 2022.
33. Yetiş Ü, Servi T, Karabağ B. Fitness Merkezlerinde Egzersiz Yapan Bireylerin spora Güdülleme Düzeylerinin belirlenmesi: Adıyaman İli örneği. *Beden Eğitimi Ve Spor Bilimleri Dergisi*. 2019;13(1):18–27.
34. İmamoğlu Kaya M, Çiçek G, İmamoğlu M. Kadın futbolcularda Algılanan stres, sporda güdülme, Sürekli Öfke ve Öfke Tarzı düzeyleri. *J Int Social Res*. 2020;13:74.
35. Yazıcı NA, Maçça E. Üniversite Personelinin sporda Güdülleme Düzeylerinin araştırılması: Recep Tayyip Erdoğan Üniversitesi örneği. *Gaziantep Üniversitesi Spor Bilimleri Dergisi*. 2021;6(4):329–42.
36. Serin C. Türk milli yekencilerinin motivasyon ve kontrol odağı ilişkisinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 447378). 2016.
37. Raiola G, Scassillo I, Parisi F, Di Tore PA. Motor imagery as a tool to enhance the didactics in physical education and artistic gymnastic. *Int Netw Sport Health Sci*. 2013;8(2):93–7.
38. Şahin F. Takım ve bireysel spor yapan sporcuların zihinde canlandırma beceri düzeylerinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 385939). 2014.
39. Savaş M. Okul Sporlarına Katılan ortaöğretim öğrencilerinin Imgeleme becerileri Kullanımı ile sportif Güven düzeyleri Arasındaki İlişkinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 540142). 2019.
40. Bayrak Ayaz E. Kadın sporcularda imgelemenin sportif güven üzerine etkisinin incelenmesi. (Doktora Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 585650). 2019.
41. Çil H. Tekerlekli sandalye basketbol branşı oyuncularının sporda imgeleme düzeylerinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 715778). 2021.
42. Güler İ, Erhan SE. Sporcularda duygusal Zekâ ile motivasyon Arasındaki İlişkinin incelenmesi. *Uluslararası Egzersiz Psikolojisi Dergisi*. 2022;4(1):30–7.
43. Lupo C, Guidotti F, Goncalves CE, Moreira L, Doupona Topic M, Ballardini H, Capranica L. Motivation towards dual career of European student-athletes. *Eur J Sport Sci*. 2015;15(2):151–60.
44. Özasan BR. Takım ve ferdî sporcuların güdülme düzeylerinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 562810). 2019.
45. Pulat S. Takım ve bireysel sporcularda mental iyi oluş düzeylerinin araştırılması. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 689833). 2021.
46. Satılmış Ş. Mücadele sporları ile uğraşan sporcuların imgeleme, güdülme ve kaygı düzeylerinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 684160). 2021.
47. Gregg M, Hall C. Imagery as a skill: longitudinal analysis of changes in motivational imagery. *Imagination Cognition Personality*. 2018;37(4):448–57.
48. Erdoğan NG, Erhan SE. Kış Sporları ile İlgilenen sporcuların sporda Imgeleme ile sportif Güven Arasındaki İlişkinin incelenmesi. *Uluslararası Egzersiz Psikolojisi Dergisi*. 2019;1(1):15–23.
49. Cankurtaran Z. Imgelemenin yetişkin sporcuların başarısızlık korkusu, mücadele ve tehdit algılarını yordama gücü. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 690586). 2021.
50. Öner Ç. Mükemmeliyetçilik. psikolojik-taktiksel beceriler, yarışma yönelimleri ve spor yaralanma kaygısı arasındaki ilişkiler [Master's thesis]. İstanbul: İstanbul Gelişim Üniversitesi Lisansüstü Eğitim Enstitüsü; 2023.
51. Özmutlu İ. Okçuluk sporcularının sporda imgeleme becerilerinin hedef yönelimi düzeylerine etkisinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 682278). 2021.
52. Güvendi B. Elit akademi ligi futbolcularında imgeleme ve kaygı ilişkisinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 397362). 2015.
53. Bozlar V. Profesyonel futbolcuların zihinsel dayanıklılık, imgeleme ve takım bütünlüğü özellikleri arasındaki ilişkisinin incelenmesi. (Doktora Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 638521). 2020.
54. Piepiora P, Maśliński J, Gumienka R, Cynarski W. Sport technique as a determinant of athletes' personality. *Qual Sport*. 2020;6(1):33–43.
55. Başandaç G. Elit sporcularda ilerleyici gövde stabilizasyon eğitiminin anaerobik performans üzerine etkilerinin araştırılması. (Doktora Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 743892). 2022.
56. Silbernagel MS, Short SE, Ross-Stewart LC. Athletes' use of exercise imagery during weight training. *J Strength Conditioning Res*. 2007;21(4):1077–81.
57. Erdoğan N, Kocaekşi S. Elit sporcuların Sahip Olması Gereken Psikolojik Özellikler. *Türkiye Klinikleri Spor Bilimleri Dergisi*. 2015;7(2):57–64.
58. De Pero R, Amici S, Benvenuti C, Minganti C, Capranica L, Pesce C. Motivation for sport participation in older Italian athletes: the role of age, gender and competition level. *Sport Sci Health*. 2009;5:61–9.
59. Yıldırım H. Elazığ ili fitness salonlarında spor yapan kadınların spora güdülmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 624616). 2020.
60. İslam A. Ordu İlinde Spor yapan tekvandocuların güdülme düzeyleri. *Beden Eğitimi ve Spor Araştırmaları*. 2023-I;155.

61. İmamoğlu Kaya M. Kadın futbolcularda antrenmanın algılanan stres, sporda güdülenme, sürekli öfke ve öfke tarzı düzeylerine etkisi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 572385). 2019.
62. Ersöz G, Öztürk M, Kılınc F, Koşkan Ö, Çetinkaya E. Sporcuların Güdülse Yönelimlerinin Bazı değişkenlere Göre incelenmesi. *CBÜ Beden Eğitimi Ve Spor Bilimleri Dergisi*. 2012;7(1):15–26.
63. Reshetnikov AV, Prisyazhnaya NV, Reshetnikov VA, Mikhailovsky VV. Sport in the life of students of medical universities in Russia. *Sociol Med*. 2021;20(2):55–63.
64. Kesler E. Elit Güreşçilerde Bilinçli farkındalık, Sürekli optimal performans Duygu durumu, spora Katılım motivasyonu ve Stres Düzeylerinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez 625116). 2020.
65. Polat E, Doğan B, Mutlu F. An investigation of sport participation motives of the individuals doing recreative sports and competitive sports. *Int J Social Sci Res*. 2018;7(2):175–87.
66. Atasoy M, Ekiz MA. Futbolcuların Güdülenme (motivasyon) ve İmgeleme düzeyleri Arasındaki İlişkinin Araştırılması. *Uluslararası Bozok Spor Bilimleri Dergisi*. 2021;2(2):119–36.
67. Özen A. Y ve z kuşağındaki taekwondo sporcularının çok boyutlu mükemmeliyetçilik düzeylerinin sporda güdülenme ve başarı motivasyonu ile ilişkisinin incelenmesi. (Yüksek Lisans Tezi). Yükseköğretim Kurulu Ulusal Tez Merkezi'nden edinilmiştir. (Tez No. 551423). 2019.
68. Aqil BA. Individual differences in the level of some mental processes of the latent action and its relationship to the age variable of soccer players. *DSPACE J*. 2020;12(3):513–22.
69. Kaya DG, Günay M. Güreş Grekoromen milli sporcularının İmgeleme ve Başarı motivasyon düzeyleri Arasındaki İlişkinin incelenmesi. *Spormetre Beden Eğitimi Ve Spor Bilimleri Dergisi*. 2020;18(3):62–72.
70. Şahinler Y. Sporcuların İmgeleme Düzeylerinin incelenmesi. *Bilge Uluslararası Sosyal Araştırmalar Dergisi*. 2019;5(1):45–51.
71. Kartal Z, Güvendi B, Türksoy A, Altıncı E. Takım sporcularının İmgeleme Kullanımları İle Başarı motivasyonları Arasındaki İlişki. *İstanbul Üniversitesi Spor Bilimleri Dergisi*. 2017;7(1):41–53.
72. Semidara JAT. Augmenting physical skills practice with psychological skills training for performance enhancement in sports among international school students. *Lagos*. (Doctoral dissertation, University of Lagos). 2012.
73. Yamak B. Kadın Hentbolcularda İmgeleme Düzeylerinin Karşılaştırılması. *Spor Eğitim Dergisi*. 2019;3(3):55–62.
74. Türkçapar Ü, Çakar A. Beden Eğitimi ve spor Yüksekokulu öğrencilerinin Hayal Etme Düzeylerinin incelenmesi. *Beden Eğitimi Ve Spor Bilimleri Dergisi*. 2021;15(2):329–38.
75. Kul M, Şipal O, Aksoy ÖF, Boz E. Sporcu Algılarına Göre halter antrenörlerinin Etik liderlik Davranışlarının incelenmesi. *J Sport Sci Res*. 2020;5(2):247–56.
76. Kolayış H, Sarı İ, Köle Ö. Takım Sporlarıyla Uğraşan Kadın sporcuların imgeleme, Güdülenme ve Kaygı Puanları Arasındaki İlişkinin incelenmesi. *Spormetre Beden Eğitimi Ve Spor Bilimleri Dergisi*. 2015;13(2):129–36.
77. Koronios K, Psiloutsikou M, Kriemadis A. What motivates repeated participation in ultra-endurance events? A comparison between runners and cyclists. *Bus Entrepreneurship J*. 2016;2(5):17–34.
78. Koronios K, Psiloutsikou M, Kriemadis A, Gkatsis G, Mavromati M. Motivation and high performance sports events: an exploratory investigation of the motives underlying repeated participation. *Int J Sport Manage Mark*. 2019;19(1–2):35–55.
79. Williams SE, Cumming J. Challenge vs. threat: investigating the effect of affective and physiological States on athletes' use of imagery. *J Sports Sci*. 2012;30(9):917–24.
80. Morris T, Spittle M, Watt AP. Imagery in sport. *Hum Kinetics*. 2005.
81. Deci EL, Ryan RM. The what and why of goal pursuits: human needs and the self-determination of behavior. *Psychol Inq*. 2000;11(4):227–68.
82. Vallerand RJ. Intrinsic and extrinsic motivation in sport and physical activity. *Handb Sport Psychol*. 2007;3:59–83.
83. Guillot A, Collet C. Construction of the motor imagery integrative model in sport: A review and theoretical investigation. *Int Rev Sport Exerc Psychol*. 2008;1(1):31–44.
84. Williams SE, Cumming J, Edwards MG. The functional equivalence between movement and imagery: A systematic review. *J Sport Exerc Psychol*. 2013;35(6):537–59.
85. Mallett CJ, Hanrahan SJ. Elite athletes: why does the 'fire' burn so brightly? *Psychol Sport Exerc*. 2004;5(2):183–200.
86. Clancy RB, Herring MP, MacIntyre TE, Campbell MJ. A review of competitive sport motivation research. *Psychol Sport Exerc*. 2016;27:232–42.
87. Parker JK, Lovell GP. Age differences in the vividness of youth sport performers' imagery ability. *J Imag Res Sport Phys Activity*. 2012;7(1).

Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.