

# Assessment of causal attributions related to weight loss in athletes from different combat sports

Egemen Ermiş<sup>1ABDE</sup>, Aydan Ermiş<sup>2ABD</sup>, Osman İmamoğlu<sup>1ACD</sup>

<sup>1</sup>Faculty of Sport Sciences, Ondokuz Mayıs University, Turkey

<sup>2</sup>School of Foreign Languages, Ondokuz Mayıs University, Turkey

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## Abstract

**Background and Study Aim** Rapid weight loss before competition is a common practice in combat sports. Athletes apply various methods to achieve weight reduction prior to official weigh-ins. These practices may influence both competitive readiness and health status. This study aims to examine differences in causal attributions related to weight loss in athletes of different combat sports in terms of gender, type of combat sport, and weight loss status.

**Material and Methods** The Causal Dimensions Scale was completed by 280 athletes (145 males and 135 females). Independent t-tests, one-way analysis of variance, and the LSD test were used in the analysis of the results to determine differences between groups.

**Results** No significant difference was found in the locus of causality dimension with respect to gender ( $p > 0.05$ ). Significant differences were found in the external control, personal control, and stability dimensions ( $p < 0.05$  and  $p < 0.001$ ). Statistically significant differences were found in the causality, external control, personal control, and stability dimensions in terms of the sport being Olympic or non-Olympic ( $p < 0.05$ ). Statistically significant differences were also found in these dimensions according to the classification of sports as grappling-based or striking-based ( $p < 0.05$ ). The difference in locus of causality, external control, personal control, and stability dimensions was statistically significant when comparing athletes who lost weight before every competition, before important competitions, and those who never lost weight ( $p < 0.05$  and  $p < 0.001$ ).

**Conclusions** Causal attributions related to weight loss in combat sports athletes differed in terms of gender, participation in Olympic or non-Olympic sports, and weight loss status. Olympic sport athletes attributed success more to internal, controllable, and stable factors, whereas external attributions were more prominent in non-Olympic sports. Athletes who lost weight before every competition had lower control perceptions and more unstable causal attributions. Planning sport-specific psychological skills training, especially in non-Olympic sports, is recommended to strengthen practices aimed at increasing control perceptions and to reduce frequent weight loss practices in combat sports athletes.

**Keywords:** causal attribution, combat athlete, external control, internal control, weight loss

## Introduction

Weight regulation is an integral component of preparation in weight-category sports. Athletes frequently manipulate body mass prior to competition to meet required limits within a short time frame. Such practices combine physiological, behavioral, and psychological factors that affect performance readiness and well-being. Athletes must evaluate whether weight loss was effective or harmful and interpret the reasons for success or failure. The most comprehensive explanation of these evaluations is provided within the framework of attribution theory.

Attribution theory explains how people interpret the causes of success and failure and how these explanations influence behavior [1, 2, 3]. Attributions may be directed toward personal characteristics or environmental conditions and represent explanations

of behavioral outcomes [3, 4]. Internal attribution refers to causes related to personal qualities such as ability, effort, or attitude, whereas external attribution refers to situational factors outside the individual [4]. Explanations of outcomes are commonly associated with ability, effort, task difficulty, and luck, which can be organized within the dimensions of locus of causality and stability [5]. Stability reflects whether causes remain constant over time, and controllability reflects whether the individual can influence the cause [2, 3, 5]. These beliefs affect emotional responses, expectations of success, and future effort investment [2, 4]. Understanding causal attributions therefore provides information about behavioral regulation and motivation [2, 5].

In this context, combat sports such as judo, wrestling, boxing, taekwondo, karate, and muay thai are organized according to athletes' body weight to ensure fair competition [6, 7]. To gain competitive advantage, athletes frequently attempt rapid

weight reduction before competitions, often using aggressive methods [8]. These practices include severe caloric restriction, dehydration, vomiting, laxatives, diuretics, and training in hot environments [9]. Athletes may lose up to 10% of their body mass using such strategies in order to compete in a lower weight category [10, 11].

As athletes participate in multiple competitions during a season, they repeatedly undergo weight loss procedures throughout their careers [12, 13]. These practices are often implemented using unhealthy methods to reach the required weight category [6]. Health risks associated with rapid weight loss include poor nutritional status, impaired physical performance, disrupted growth and development, dehydration, fatigue, muscle cramps, electrolyte imbalance, increased heart rate, reduced cardiac output, and impaired thermoregulation [14]. Rapid weight loss has also been linked to decreased sport-related memory, self-confidence, and concentration, as well as increased stress, irritability, and performance anxiety [15, 16].

In Turkey, causal attributions of female and male athletes are influenced not only by physiological gender differences but also by gender roles, sport structure, and coaching approaches. The sports environment has historically developed within a male-dominated structure, leading female athletes to experience more protective and restrictive evaluations during training [17, 18]. Social expectations and cultural norms shape perceptions regarding injury risk and physical endurance in female athletes, influencing causal attributions [19]. Greater professionalization among male athletes leads to more intense attributions, whereas female athletes experience more unstable attributions [20].

Male combat sport athletes generally have more competition and league experience, while female athletes may encounter irregular competition schedules due to a smaller number of events [20]. Male athletes tend to display more aggressive and risk-taking combat strategies, whereas female athletes more often use controlled and technical approaches [21]. Judokas have been reported to engage in weight loss behavior more frequently and to a greater extent than karate and taekwondo athletes [22]. In Turkey, rapid weight loss methods are reported more often in kickboxing and taekwondo than in wrestling and boxing [23]. Turkish wrestlers are also among the athletes who lose weight frequently and in large amounts [24].

Analysis of research findings has shown that rapid weight loss in combat sports is a recurrent practice associated with physiological, psychological, and behavioral consequences. Researchers emphasize that athletes' interpretations of success and failure, as well as gender roles, sport characteristics, and competition experience, influence how these practices are perceived and repeated. At the same

time, the interaction between weight loss behavior and athletes' causal explanations remains complex and dependent on sport type and competitive context. Clarifying these relationships is necessary for explaining behavioral regulation and decision-making patterns in combat sport athletes.

In addition to the established knowledge about physiological and psychological consequences of rapid weight loss in combat sports, the role of athletes' causal explanations requires further clarification within specific competitive contexts. Attention has been given mainly to general weight loss practices, while differences between combat sport types and athlete characteristics remain insufficiently systematized. Identification of the factors influencing causal attributions is necessary for maintaining motivation for success and for informing coaching practice. This study aimed to investigate differences in causal attributions among combat sports athletes in terms of gender, combat sport type, and weight loss status.

## Materials and Methods

### *Participants*

The study population consisted of individuals actively involved in combat sports, and the sample included 280 athletes (145 men and 135 women). All participants were university students. The athletes were elite competitors and grouped in two different ways. First, they were divided into athletes engaged in Olympic disciplines (boxing, wrestling, judo, taekwondo, and karate) (175 athletes) and athletes engaged in non-Olympic disciplines (kickboxing, Muay Thai, and Wushu) (105 athletes). Second, they were divided into athletes engaged in grappling-based disciplines (wrestling and judo) (98 athletes) and athletes engaged in striking-based sports (boxing, kickboxing, Muay Thai, taekwondo, karate, and Wushu). Surveys were completed by elite athletes who participated in national competitions in Turkey. The participants were selected randomly based on voluntary participation. Before participation, athletes were informed about the aims, procedures, and ethical considerations of the study. The study was approved by the Ondokuz Mayıs University Social and Human Sciences Research Ethics Committee (decision no. 2025-23, dated 31.01.2025).

### *Research Design*

This study used quantitative research methods and was conducted as a descriptive study with a correlational survey model. Some surveys were completed by participants before competitions under coach supervision, while others were completed via Google Forms.

A sociodemographic information form prepared by the researchers and the Causal Dimension Scale developed by McAuley et al. [25] and adapted by Yapıcı and Koçyiğit [2] were used to collect data. The

data collection tools were completed randomly and voluntarily by the participants.

*Sociodemographic Information Form*

This form included information about athletes' gender, age, height, weight, body mass index, type of combat sport, and whether and when they preferred to lose weight.

*Causal Dimension Scale*

The scale is a 12-item instrument measuring causal attributions in four sub-dimensions: locus of causality (items 1, 6, 9), external control (items 5, 8, 12), stability (items 3, 7, 11), and personal control (items 2, 4, 10). The scale is a 9-point Likert-type self-evaluation scale. The highest possible score from three items in each sub-dimension is 27 and the lowest possible score is 3. High scores in these subdimensions indicate that the causes are internal, stable, and personally controllable [2]. Internal consistency coefficients of the sub-dimensions range between  $r=.70$  and  $r=.92$ . No total score is calculated; only sub-dimension scores are used. In the present study, the Cronbach alpha internal consistency coefficient was 0.77. Body Mass Index (BMI) was calculated using the formula  $BMI = \text{weight (kg)} / \text{height (m}^2\text{)}$ .

*Statistical Analysis*

SPSS 27.00 software was used for statistical analysis. The Kolmogorov–Smirnov test was

conducted to examine normal distribution, and the data were normally distributed. Independent t-tests, one-way analysis of variance, and the LSD test were used to determine differences between groups.

**Results**

Before presenting the anthropometric characteristics, gender differences are summarized in Table 1. While the ages of the combat athletes who participated in the study were similar between genders, statistically significant differences were observed in height, body weight, and body mass index ( $p<0.001$ ). Male athletes demonstrated consistently higher anthropometric values, indicating structural body size differences rather than age-related variation.

Before presenting the comparison of causal dimension scores, gender differences are summarized in Table 2. While no significant difference was found in the causality dimension between genders ( $p>0.05$ ), significant differences were observed in external control, personal control, and stability ( $p<0.05$  and  $p<0.001$ ). Female athletes demonstrated higher external and personal control scores, whereas male athletes showed higher stability scores, indicating different attribution patterns between genders.

Before presenting the comparison of causal dimension scores according to discipline classification, results are summarized in Table 3.

**Table 1.** Anthropometric characteristics of combat sports athletes by gender

Parameters	Gender	n	Mean	Std. deviation	t-test
Age (years)	Male	145	21.97	4.10	1.20
	Female	135	21.37	3.65	
Height (cm)	Male	145	176.35	8.99	13.92**
	Female	135	165.22	5.68	
Weight (kg)	Male	145	71.24	16.89	12.01**
	Female	135	58.92	8.77	
Body Mass Index (kg/m <sup>2</sup> )	Male	145	22.99	2.45	5.97**
	Female	135	21.65	2.27	

Note. \*\* $p<0.001$

**Table 2.** Comparison of causal dimension scores of combat sports athletes by gender

Dimension	Gender	N	Mean	Std. deviation	t-test	p
Causality	Male	145	19.24	4.06	0.96	0.748
	Female	135	18.74	3.42		
External control	Male	145	14.23	2.74	2.88	0.003*
	Female	135	15.27	2.47		
Personal control	Male	145	17.17	3.62	2.99	0.002*
	Female	135	19.57	3.46		
Stability	Male	145	19.22	3.64	3.08	0.001**
	Female	135	16.70	3.10		

Note. \* $p<0.05$ ; \*\* $p<0.001$

Statistically significant differences were found in causality, external control, personal control, and stability dimensions between Olympic and non-Olympic athletes ( $p < 0.05$ ). Olympic athletes showed higher causality, personal control, and stability scores, whereas non-Olympic athletes demonstrated higher external control scores, indicating more internally oriented attribution patterns among Olympic competitors.

Before presenting the comparison of causal dimension scores according to sport classification, results are summarized in Table 4. Statistically

significant differences were observed in causality, external control, personal control, and stability dimensions according to sport classification ( $p < 0.05$ ). Grappling-based athletes demonstrated higher external and personal control scores, whereas striking-based athletes showed higher causality and stability scores, indicating different attribution orientations depending on technical characteristics of the sport.

Before presenting the comparison according to weight loss status, results are summarized in Table 5. When comparing athletes who lost weight before

**Table 3.** Comparison of causal dimension scores of combat sports athletes by Olympic and non-Olympic disciplines

Dimension	Discipline	N	Mean	Std. deviation	t-test	p
Causality	Olympic disciplines	175	20.01	3.12	2.30	0.024*
	Non-Olympic disciplines	105	18.03	3.11		
External control	Olympic disciplines	175	14.02	2.58	2.36	0.021*
	Non-Olympic disciplines	105	15.74	2.61		
Personal control	Olympic disciplines	175	19.04	3.12	2.63	0.010*
	Non-Olympic disciplines	105	17.63	3.13		
Stability	Olympic disciplines	175	18.93	3.07	2.37	0.023*
	Non-Olympic disciplines	105	17.07	3.06		

Note. \* $p < 0.05$

**Table 4.** Comparison of causal dimension scores of combat sports athletes by grappling-based and striking-based sports

Dimension	Sport classification	N	Mean	Std. deviation	t-test	p
Causality	Grappling-based sports	98	18.05	3.16	2.35	0.022*
	Striking-based sports	182	19.99	3.14		
External control	Grappling-based sports	98	15.71	2.53	2.30	0.029*
	Striking-based sports	182	14.05	2.62		
Personal control	Grappling-based sports	98	19.07	3.11	2.65	0.009*
	Striking-based sports	182	17.60	3.10		
Stability	Grappling-based sports	98	17.04	3.07	2.38	0.024*
	Striking-based sports	182	18.96	3.07		

Note. \* $p < 0.05$

**Table 5.** Comparison of causal dimension scores of combat sports athletes according to weight loss status

Dimension	Weight loss status	N	Mean	Std. deviation	F/LSD	p
Causality	Before every competition (1)	103	16.33	3.40	8.36 (1<2,3)	0.001**
	Before important competitions (2)	88	18.98	3.82		
	Never (3)	24	19.83	3.09		
External control	Before every competition (1)	103	13.38	2.31	4.69 (1<2,3)	0.002*
	Before important competitions (2)	88	14.85	2.27		
	Never (3)	24	15.24	2.68		
Personal control	Before every competition (1)	103	14.98	3.11	13.44 (1<2,3)	<0.001**
	Before important competitions (2)	88	18.63	3.22		
	Never (3)	24	18.93	3.10		
Stability	Before every competition (1)	103	14.73	3.12	13.68 (1<2,3)	<0.001**
	Before important competitions (2)	88	18.28	3.20		
	Never (3)	24	18.56	3.19		

Note. \* $p < 0.05$ ; \*\* $p < 0.001$

every competition, before important competitions, and those who never lost weight, statistically significant differences were found in causality, external control, personal control, and stability dimensions ( $p < 0.05$  and  $p < 0.001$ ). Athletes who repeatedly reduced weight before each competition showed consistently lower attribution scores, indicating reduced perceived control and stability compared with the other groups.

## Discussion

Combat sports athletes often attempt to optimize physical condition to enhance performance despite extensive training [26]. One method used for this purpose is weight reduction. The aim of this study was to examine causal attributions of weight reduction in athletes from different combat sports. Body Mass Index values were  $22.99 \text{ kg/m}^2$  for men and  $21.65 \text{ kg/m}^2$  for women. According to the World Health Organization classification, 18.5–24.9 is considered normal [27]. Therefore, the athletes can be considered within healthy limits.

Çebikkurt [3] found no gender difference in locus of causality, stability, and personal control. Yapıcı and Koçyiğit [2] reported a gender difference only in the locus of causality dimension. Koca et al. [5] found a significant difference in the external control dimension but not in locus of causality, personal control, or stability. In the present study, no significant gender difference was found in the locus of causality dimension ( $p > 0.05$ ), whereas significant differences were found in external control, personal control, and stability ( $p < 0.05$  and  $p < 0.001$ ). Women showed higher external and personal control scores, and men showed higher stability scores. Thus, gender did not affect the locus of causality dimension.

In the present study, locus of causality scores were 19.24 for males and 18.74 for females. These values are relatively close to the maximum possible score of 27 in this dimension. Higher scores in locus of causality indicate internal attribution, whereas lower scores indicate external attribution [2]. Therefore, causal attributions were predominantly internal.

Koca et al. [5] found a statistically significant difference in the external control dimension. In the present study, external control scores were 14.23 for males and 15.27 for females ( $p < 0.05$ ). A high score in the external control dimension indicates that attribution is controllable by others, whereas a low score indicates uncontrollability [2]. According to these results, both groups demonstrated moderate controllability, with higher values observed in women.

Personal control scores were 17.17 for males and 19.57 for females in the present study, and the difference was statistically significant ( $p < 0.05$ ). Koca et al. [5] reported no significant difference

in this dimension. A high score in the personal control dimension indicates that attribution is controllable by the individual, whereas a low score indicates lack of personal control [2]. These findings indicate higher personal controllability among women despite generally high personal control characteristics in combat sport athletes.

Stability scores were 19.22 for men and 16.73 for women, and the difference was statistically significant ( $p < 0.001$ ). Men demonstrated higher stability scores. A high stability score indicates a permanent cause, whereas a low score indicates a variable cause [2]. Therefore, attribution causes in male athletes were more stable than in female athletes.

Çebikkurt [3] reported that analysis of Causal Dimensions Scale-II subscales in handball players showed higher stability, personal control, and locus of causality scores in winning teams than in losing teams, whereas external control scores were similar. Koca et al. [5] found no significant difference between team and individual athletes in locus of causality, personal control, and stability scores, while team athletes had significantly higher external control scores than individual athletes.

The present study revealed statistically significant differences in causal attribution scores of combat sport athletes in causality, external control, personal control, and stability dimensions according to Olympic and non-Olympic classification ( $p < 0.05$ ). Athletes engaged in Olympic sports showed higher scores in causality, personal control, and stability than those in non-Olympic sports. However, Olympic athletes had lower scores in the external control dimension.

The finding that Olympic athletes scored higher in causality, personal control, and stability but lower in external control is notable. According to Weiner's attribution theory [28, 29], attribution of performance outcomes to internal (effort, ability) or external (luck, referee, opponent) factors affects motivation, emotional responses, and future expectations. Higher causality scores among Olympic athletes indicate greater attribution of success to internal factors. This may be associated with long-term planning, systematic training, and performance monitoring in Olympic sports [30]. Higher personal control and stability scores further indicate that success is linked to individual effort and consistent performance factors.

Previous studies emphasize that elite athletes attribute success more to controllable and stable factors, supporting motivational resilience and sustained performance [31, 32]. Frequent international competition, objective performance evaluation, and long-term development models in Olympic sports may contribute to this attribution pattern. Lower external control scores suggest that Olympic athletes associate outcomes with their own

preparation rather than referee decisions, luck, or environmental conditions. This is consistent with findings in combat sports, where athletes often attribute results to their own performance [33, 34]. Olympic-level athletes may assume greater responsibility for performance, reducing perceived external control. In contrast, non-Olympic athletes may show higher external control due to less structured competition systems and lower professionalization. Athletes may protect self-esteem by attributing outcomes to factors beyond their control, a pattern described as self-protective attribution [29, 35]. A meta-analysis showed that athletes attribute personal success to internal factors and personal failure to external factors, and assume greater responsibility for team success than for team failure [35].

In the present study, statistically significant differences were found in causality, external control, personal control, and stability according to grappling-based and striking-based sport classification ( $p < 0.05$ ). Athletes engaged in grappling-based sports scored higher in external control and personal control than those in striking-based sports. In contrast, they scored lower in causality and stability dimensions. These findings indicate higher perceived controllability but lower internal and stable attribution patterns among grappling-based athletes.

A high perception of personal control indicates that athletes associate performance outcomes with their own actions [28, 29]. In grappling-based sports (e.g., wrestling, judo), direct physical contact, continuous interaction, and rapid decision-making strengthen the subjective sense of control over performance. De Michele et al. [33] reported that wrestlers associated success with high personal control. At the same time, higher external control scores suggest a strong influence of opponent behavior, referee decisions, and competition dynamics. This may reflect the immediate and interactive nature of contact sports, where performance outcomes depend on both participants [35].

Higher causality and stability scores in striking-based sports indicate stronger attribution to internal and consistent factors. In striking disciplines (e.g., karate, taekwondo), repetitive technique execution and long-term technical consistency may reinforce attribution to enduring personal characteristics [32].

Koca et al. [5] reported that athletes who consistently lost weight had lower locus of causality, external control, personal control, and stability scores than those who sometimes or never lost weight, and these differences were significant. In the present study, significant differences were also found in locus of causality, external control, personal control, and stability when comparing athletes who lost weight before every competition, before important competitions, and those who

never lost weight ( $p < 0.05$  and  $p < 0.001$ ). In the locus of causality dimension, athletes who lost weight before every competition scored lower than the other groups, indicating greater attribution to external factors, whereas the other groups showed more internal attribution.

In the external control dimension, higher scores indicate greater controllability and lower scores indicate reduced controllability. Athletes who lost weight before every competition demonstrated lower controllability than those who lost weight before important competitions or never lost weight. In the personal control dimension, higher scores indicate control by the individual and lower scores indicate lack of personal control. Personal controllability decreased among athletes who lost weight before each competition, which may negatively influence their training and competitive interactions.

In the stability dimension, lower scores among athletes who lost weight before each competition indicate more variable causal attributions compared with the other groups.

When weight loss or failure to lose weight becomes central in daily life, success or failure may be perceived as more personal, restrictive, and stressful [5]. Severe weight changes may lead to short-term electrolyte depletion, reduced glycogen stores, hormonal variability, inadequate protein intake, impaired psychological and physiological performance, pulmonary artery obstruction, pancreatitis, and weakened immune function. Can [36] concluded that causal attributions related to success are more internal, stable, and controllable than those related to failure. In Taşkıran's [37] study, participants made more causal attributions for failure than for success. Therefore, athletes who repeatedly lose weight may produce more explanations for failure, many of which may be attributed to external factors.

#### *Limitations of the Study*

The study was conducted with university athletes participating in national competitions in one country, which restricts generalization to other competitive levels and cultural contexts. Data were collected using self-report questionnaires, and responses may reflect subjective perception and recall bias. The cross-sectional design does not allow evaluation of causal relationships between attribution patterns and weight loss behavior. Classification of sports and weight loss status was based on categorical grouping, which may not fully represent variability in training load, competition level, or weight management strategies.

Future studies may examine attribution patterns using longitudinal designs, include physiological monitoring of weight loss methods, and compare athletes from different competitive levels and countries. Investigations combining psychological

measures with performance and health indicators may clarify how attribution patterns relate to behavioral adaptation and competitive outcomes.

## Conclusions

Causal attributions related to weight loss differed among athletes from different combat sports according to gender, sport classification, and weight loss status. The locus of causality dimension, which reflects internal orientation, did not vary by gender. Women demonstrated higher controllability scores, whereas male athletes showed more stable attribution patterns. Athletes engaged in Olympic sports attributed success more to internal, controllable, and stable factors, while athletes in non-Olympic sports emphasized external factors. In grappling-based sports, perception of control was more pronounced, whereas in striking-based

sports success was explained more by internal and stable factors. Athletes who lost weight before each competition showed lower controllability and less stable attribution patterns, with greater reliance on external explanations.

These findings indicate the relevance of sport-specific psychological skills training aimed at strengthening perception of control and responsibility, particularly in non-Olympic sports. Reducing the frequency of rapid weight loss practices in combat sport athletes is also advisable.

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## Conflict of Interest

The authors declare no conflict of interest.

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### Information about the authors:

**Egemen Ermiş;** Assoc. Prof. Dr.; <https://orcid.org/0000-0002-3976-6981>; egemen.ermis@omu.edu.tr; Faculty of Sport Sciences, Ondokuz Mayıs University; Samsun, Turkey.

**Aydan Ermiş;** (Corresponding Author); Assoc. Prof. Dr.; <https://orcid.org/0000-0003-2285-7980>; aydanak@omu.edu.tr; School of Foreign Languages, Ondokuz Mayıs University; Samsun, Turkey.

**Osman İmamoglu;** Prof. Dr.; <https://orcid.org/0000-0001-6671-6042>; osmani55@hotmail.com; Faculty of Sport Sciences, Ondokuz Mayıs University; Samsun, Turkey.

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