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An Investigation of Weight Loss Methods of Individual Combat Athletes

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ABSTRACT

The aim of this study is to examine the weight loss methods of individual combat athletes in different branches. A total of 242 individual combat athletes aged 18-35 with weight loss experience participated in the research. "Athlete Weight Loss Methods and Effects Scale" was used as a data collection tool. SPSS program was used to analyze the data. Since the data were not normally distributed, the Kruskal Wallis H Test was used to analyze the difference between the groups. 88.1% of the athletes participating in the research stated that they reduced their food intake, 83.1% stated that they jogged in raincoats, and 50% tried to lose weight by using the sauna. 66.5% of the athletes participating in the research reported that they were successful in many competitions when they lost weight. There is a significant difference in the age at which athletes first lose weight according to their branches. No significant difference was found in the sub-dimensions of the scale according to the athletes' branches. It can be said that the individual combat athletes participating in the research used similar weight loss methods. In conclusion; Athletes should not apply rapid weight loss strategies to avoid performance losses. If an athlete needs to adjust their body weight, they should implement strategies (nutritional and fluid intake) that will help minimize potential negative effects.

1. INTRODUCTION

Individual combat sports (boxing, wrestling, judo, taekwondo, kick boxing, muay thai, etc.) are divided into specific weight classes that aim for fair competition based on equal body weights [1]. In general, athletes aim to compete at the lightest possible weight and gain a competitive advantage over their rivals, believing that they are stronger, more durable, and faster than athletes in lower weight classes [2]. Therefore, many athletes reach their target weight through acute and chronic pathways involving energy restriction and dehydration [1]. Since 1970, scientific studies have shown that weightlifting athletes use harmful weight loss methods such as a severely restricting providing nutritional and liquid support, exercising in rain gear, using saunas, taking diet pills, and even vomiting [2-5]. Of the weight loss methods, especially high-grade dieting, increased exercise and fluid restriction are commonly used by all competitive athletes [6]. Athletes who experience weight loss in a short time experience serious health problems and various physiological and psychological problems. Loss of 2% of body weight with dehydration is dangerous for health and causes athletes to lose performance [7]. With dehydration, fluid and electrolyte loss, decrease in muscle strength and maximal oxygen consumption, decrease in glycogen stores, decrease in plasma fluid and blood volume, irregular body temperature, hemodynamic disorders and consequently loss of performance [8]. In case of acute weight loss, heart rate increases, O_2 transfer to muscle cells and blood viscosity decrease due to hematocrit [9], increase in erythrocyte count and hemoglobin concentration, increase in calcium level, circulatory collapse, decrease in blood potassium level, fatigue, decreased desire to perform, and a significant decrease in maximal oxygen uptake in the blood, which is an indicator of blood circulation condition in the heart [10]. Acute weight loss methods accelerate the depletion of the athlete's glycogen stores in the muscles, reduce the liquid plasma volume, damage aerobic and anaerobic performance, imbalance the fluid-electrolyte balance and increase the heart rate

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above normal [11]. In some cases, it may be necessary to lose weight up to the day of competition in order to enter lower weight classes. This can be tolerated with a high-protein diet that is spread over a long period of time, supported by light physical measures and utilization of fat stores [10].

A healthy weight for athletes should be a weight that can be maintained, and this weight should not negatively affect exercise performance and should not pose a risk of injury and chronic disease [12]. In the literature, studies on weight loss methods of combat athletes have been conducted in Olympic sports branches such as wrestling, judo, boxing, weightlifting, taekwondo [2,5,11,13-18]. There are very few studies on muay thai, kick boxing, wushu, which are other combat sports that are increasing in popularity today, so it is thought that this study will contribute to the literature. Individual competition athletes need to learn how to make weight adjustments in a long-term and planned manner in order to lose weight quickly and not lose performance. It is thought that this study will raise awareness among athletes and be a pioneer for researchers to plan experimental studies. From this point of view, the aim of this study is to determine the weight loss methods and effects of individual combat athletes (muay thai, kick boxing, taekwondo, boxing, wushu).

2. MATERIALS AND METHODS

In this study, it was aimed to examine the weight loss methods of individuals practicing different individual combat sports. In this direction, descriptive method was chosen and survey model was used in the research. Before starting the research, approval was obtained from the Ethics Committee of Mersin University Institute of Social Sciences. This study was carried out after the approval of the Ethics Committee of Mersin University Institute of Social Sciences. Participant provided informed consent, with the volunteer form covering research details, risks, benefits, confidentiality, and participant rights. The research strictly adhered to the ethical principles of the Declaration of Helsinki, prioritizing participant's rights and well-being in design, procedures, and confidentiality measures.

2.1. Research Group

The population of the study consisted of federation-approved licensed athletes in Muay thai, Kick boxing, Boxing, Wushu and Taekwondo branches in Turkey, while the sample consisted of 242 individual (114 women 128 men) combat athletes (muay thai, kick boxing, wushu, boxing, taekwondo) with weight loss experience between the ages of 18-35. 277 individual combat athletes participated in the study, and the data that did not meet the research criteria were excluded from the study.

2.2. Data Collection Tool

The data of the study were collected with the "Athlete Weight Drop Methods and Effects Scale" and were transmitted to the athletes online via Google Drive.

2.2.1. Athlete weight drop methods and effects scale

The data in the study were obtained using a scale. The "Athlete Weight Drop Methods and Effects Scale" developed by Yarar et al. (2016) [19] (alpha value α=0.74) was used as a data collection tool. The first part of the scale, which consists of two parts, consists of questions about the demographic characteristics of the participants, and the second part consists of 32 questions and five sub-dimensions related to weight loss methods and effects. The sub-dimensions were named as "Physiological Effects", "Psychological Effect, "Ergogenic Assistance", Diet and Fluid Loss. The numerical equivalents of the responses to be given in the scale were determined as Never=1, Rarely=2, Occasionally=3, Frequently=4, Always=5.

2.3. Statistical Analysis

The data were analyzed with the SPSS program. After checking for incorrect or missing data, descriptive statistics, arithmetic means (X) and percentage frequency (%) distributions were calculated. Since the data were not normally distributed, Kruskal Wallis H analysis was used to compare the sub-dimensions of the scale and branches.

3. RESULTS

Table 1. Demographic characteristics of athletes according to branches

Variables		Muay Thai (n=79)	Kick Boks (n=49)	Boxing (n=41)	Wushu (n=37)	Taekwondo (n=36)
Gender	Woman	% 45.6	% 53.1	% 36.6	% 45.9	% 52.8
	Male	% 54.4	% 46.9	% 63.4	%54.1	% 47.2
Education Status	High School	% 43	% 34.7	% 22	% 40.5	% 30.6
	License	% 49.4	% 59.2	% 61	% 56.8	% 66.7
	Postgraduate	% 7.6	% 6.1	% 17	% 2.7	% 2.8
Bachelor's Degree	Sports Sciences	% 41.8	% 59.2	% 70.7	% 54.1	% 61.1
	Other sections	% 58.2	%40.8	% 29.3	% 45.9	% 38.9
National athlete status	Yes	%72. 2	% 65.3	% 61	% 51.4	% 50
	No	% 27.8	% 34.7	% 39	% 48.6	% 50

Table 2. Athletes' age, sports age and weight loss experiences according to branches

Variables	Muay Thai (n=79)	Kick Boks (n=49)	Boxing (n=41)	Wushu (n=37)	Taekwondo (n=36)
Age (year)	23.08	24.06	25.8	22.86	23.22
Sport age (year)	8.59	9.38	9.34	6.48	8.97
Age at first weight loss (year)	16.08	16.71	18.26	17.59	16.13
The most kilograms dropped at one time (kg)	5.89	4.91	4.80	4.75	4.63

In Table 2, it is seen that the athletes lost the most weight at one time with 5.89 and the age of the first weight loss among the branches is the Muay Thai branch with the youngest age of 16.08.

Table 3. Kruskal Wallis H test results of athletes' sport age and weight loss experience according to branches

	Sport	n	$\bar{X}$	Sd	Row Average	X^2	p
Sport age (year)	Muay Thai	79	8.59	0.53	121.47	9.11	0.58
	Kick Boks	49	9.38	0.84	128.77		
	Boxing	41	9.34	0.82	131.02		
	Wushu	37	6.48	0.54	91.16		
	Taekwondo	36	8.97	0.71	132.01		
Age at first weight loss (year)	Muay Thai	79	16.08	0.33	107.59	16.66	0.02*
	Kick Boks	49	16.71	0.49	120.31		
	Boxing	41	18.26	0.59	156.80		
	Wushu	37	17.59	0.74	130.74		
	Taekwondo	36	16.13	0.60	103.93		
The most kilograms dropped at one time (kg)	Muay Thai	79	5.89	0.29	142.08	10.35	0.35
	Kick Boks	49	4.91	0.36	111.45		
	Boxing	41	4.80	0.34	112.46		
	Wushu	37	4.75	0.35	110.22		
	Taekwondo	36	4.63	0.30	111.92		

*p<0.05

A significant difference was found at the level of p<0.05 in the age of first weight loss according to the branches of the athletes. It is seen that the age at first weight loss is the lowest in Muay Thai branch with 16.08 and the highest in Boxing branch with 18.26.

Table 4. Kruskal Wallis H test results of the sub-dimensions of the 'Athlete Weight Drop Methods and Effects Scale' according to the branches of the athletes

Sub-dimensions	Sport	n	Row average	X^2	p
Diet	Muay Thai	79	119,79	3,22	0,52
	Kick Boks	49	110,03		
	Boxing	41	118,28		
	Wushu	37	139,61		
	Taekwondo	36	125,92		
Fluid Loss	Muay Thai	79	122,88	2,55	0,63
	Kick Boks	49	111,70		
	Boxing	41	111,93		
	Wushu	37	131,89		
	Taekwondo	36	132,03		
Ergogenic Assistance	Muay Thai	79	113,87	3,97	0,40
	Kick Boks	49	119,05		
	Boxing	41	123,62		
	Wushu	37	137,09		
	Taekwondo	36	123,14		
Physiological Effects	Muay Thai	79	114,14	4,09	0,39
	Kick Boks	49	119,66		
	Boxing	41	125,01		
	Wushu	37	119,20		
	Taekwondo	36	138,51		
Psychological Effects	Muay Thai	79	116,75	3,40	0,49
	Kick Boks	49	116,87		
	Boxing	41	133,87		
	Wushu	37	116,42		
	Taekwondo	36	129,36		

*p<0.05

No significant difference was found in the sub-dimensions of the scale according to the branches of the athletes. It can be said that Muay thai, kick boxing, boxing, wushu and taekwondo athletes lost weight in a similar way, their diet and fluid restriction methods were similar, and they were affected physiologically and psychologically similarly as a result of weight loss.

4. DISCUSSION

Individual combat athletes lose weight to compete in lighter weights, often preferring rapid weight loss, which may result in losses in athletic performance [9]. Studies have shown that in spite of the negative effects of rapid weight loss strategies on athlete health and athletic performance, these methods are used by 60-90% of weightlifters [11].

As a result of the study, the sports age (years) of the athletes in the branches of muay thai 8.59, kick boxing 9.38, boxing 9.34, wushu 6.48 and taekwondo 8.97. Among the athletes who participated in the study, 67.4% stated that they had difficulty in weight loss, while 32.6% stated that they did not have difficulty in weight loss. Kurt and Sağıroglu (2015) [20] examined the rapid weight loss methods of combat athletes (112 athletes in judo, karate, muay thai, taekwondo, and wrestling branches) and found that 54.5% of the athletes were national athletes and the average age of the athletes was 10.42 years.

Xiong et al. (2017) [21] found that the average age of onset of weight loss in boxing, karate and taekwondo athletes was 15.9 years. Çatıkkaş (2016) [22] found that the average age of starting rapid weight loss methods in taekwondo athletes was 14.51 years. The results of the studies in the literature and the results of our study show that athletes start to lose weight at an early age. It is predicted that individuals who continue to lose weight suddenly in sports for many years may encounter various health problems in the future. For this reason, athletes should not start to lose weight before completing the developmental age and should not continue sudden weight loss in very high amounts for many years in order to protect health.

Among the athletes who participated in the study, 88.1% stated that they reduced their food intake, 83.1% stated that they jogged with raincoats, and 50% stated that they tried to lose weight by using sauna. Çatıkkaş (2016) [22], in his study examining the rapid weight loss methods of taekwondo athletes, stated that the most preferred rapid weight loss methods of the athletes were fasting 65.7%, dressing in layers 60%, sauna 42.9%, skipping meals 42.9%, monotonous nutrition 28.6% and use of fat burning supplements 22.9%, respectively. Kurt and Sağıroglu (2015) [20] reported that the most commonly used methods of rapid weight loss in individual combat athletes were dressing in layers 75%, skipping meals 64.30%, starvation 63.4%, sauna use 58%. Brito et al. (2012) [23] examined the methods of reducing body mass in 580 combat athletes (judo, jujitsu, karate and taekwondo) and reported that 60% of the athletes aimed to lose weight with activities requiring rapid energy expenditure, 50% of them tried to lose weight with sauna and raincoat, and only 26% of them received advice from a nutritionist. In addition, they reported that some athletes used unapproved or prohibited methods such as diuretics, sauna and raincoat running. Hall and Lane (2001) [24], in their study on amateur boxers, reported that athletes who lost 5% of their body weight in a week by restricting their fluid and food intake decreased their performance, increased fatigue, tension and anger. Yang et al. (2014) [9] measured the physiological and psychological effects of rapid weight loss in taekwondo athletes and concluded that athletes who did not lose weight quickly had better physiological and psychological performance than athletes who lost weight quickly (the group that lost 5% of body weight in 4 days). The results of the study similarly reveal that individual combat athletes prefer methods for sudden weight loss that are detrimental to athletic performance and health. Therefore, coaches and athletes should use weight loss strategies correctly to prevent a potential decline in performance.

In our study results, 44.6% of the athletes stated that they lost weight 1 month before the matches. More athletes have lost weight in recent weeks. İmamoğlu et al. (2017) [25] found that the rate of those who started to lose weight in 9 days or more after the competitions was 45.5%. Santos et al. (2016) [26] found the number of days to start weight loss in taekwondo players between 10-20 days in their study. Xiong et al. (2017) [21] found that the time to start weight loss was 11.9 days in their study. In the results of our study, it was found that the majority of the athletes started to lose weight 1 month. In the studies in the literature, it was revealed that combat athletes lost weight in a shorter time. This difference may be thought to be due to the differences in the age, gender, sports age and branches of the athletes.

Individual combat athletes resort to acute weight loss in order to be more durable, stronger, faster than their competitors and to gain superiority, and as a result, they may experience performance losses and various health problems. Yamak (2019) [27], in a study with elite wrestling and judo athletes (128 women-158 men), reported that aerobic and anaerobic power values of athletes who lost 3-7% of their body weight were lower compared to their performance before weight loss. In a study conducted by Zengin et al. (2003) [28] with judo athletes, it was reported that the general and relative strength of athletes who lost weight suddenly before the competition were negatively affected. Roemmich and Sinning (1997) [29] followed the pre-season and post-season weight loss of wrestlers and reported that restricting food intake for sudden weight loss negatively affected muscle strength. Aslan (2018) [16] examined the weight loss methods of 148 combat athletes (wrestling, boxing and weightlifting branches) and found that male athletes were more affected by fluid loss than female athletes, but less affected physiologically and psychologically. The fact that men were more affected by fluid loss was explained by the fact that they did more actions such as sweating in the sauna and running in raincoats while losing weight, and the fact that men were less affected than women in physiological and psychological dimensions was explained by the fact that they were more resistant to muscle cramps, heart palpitations, breathing difficulties, desire to do sports, performance, stress, irritability and fatigue while losing weight.

Among the athletes who participated in the study, 66.5% stated that they were successful in many competitions when they lost weight, 19% stated that they were not successful in many competitions when they lost weight, 11.2% stated that they were successful in all of them, and 3.3% stated that they were not successful in any of them. 33.9% of the athletes stated that they lost weight because their current weight was between two weights, 30.6% stated that they lost weight in order to be faster, faster, more durable and more mobile than their opponents by losing weight, and 21.9% stated that they lost weight because they considered themselves inadequate in the upper weight class. In their study to determine the weight loss behavior of athletes participating in karate and taekwondo competitions, Koca and İmamoğlu

(2018) [30] found that the total rate of athletes who were successful in the matches in which they lost weight was 41.76%, while the rate of athletes who lost weight was 41.76%. The success rate in matches where athletes do not lose weight is 45.49%. 31.28% of the athletes who dropped down to weight stated that they lost weight to be stronger against their opponents, and 35.15% stated that they lost weight to increase their chances of winning. The results of our study show that athletes are mostly successful in competitions in which they lose weight, which is not consistent with studies in the literature. The reasons for weight loss are similar to the studies in the literature. The most prominent reasons for weight loss in individual combat athletes were the desire to be superior to a lower weight opponent, to perform better and to increase the chance of winning.

5. CONCLUSION

In conclusion, athletes should not apply rapid weight loss strategies. Both athletic performance and health of the athlete are negatively affected. If an athlete needs to adjust their body weight, they should implement strategies to help minimize potential negative effects. Since an athlete losing more than 5% of his body weight will cause dehydration and performance losses, a top weight class may be considered to compete.

Conflict of Interest

There is no conflict of interest between the authors in this study. No financial support was provided for this study.

Ethics Committee

The study protocol was approved from the Ethics Committee of Mersin University Institute of Social Sciences. (Ethics Committee Approval: 2020/35).

Author Contributions

Study Design, GA, İY; Data Collection, GA; Statistical Analysis, GA; Data Interpretation, GA, İY; Manuscript Preparation, GA, İY; Literature Search, GA, İY. All authors have read and agreed to the published version of the manuscript.

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