

The Effect of Acute Weight Loss on Body Composition, Self-esteem and Appearance Esteem before Competitions

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Received: July 13, 2016

Accepted: August 22, 2016

Online Published: October 19, 2016

doi:10.11114/jets.v4i11.1732

URL: <http://dx.doi.org/10.11114/jets.v4i11.1732>

Abstract

Weight loss in human body accompanies physical and psychological differences. In this study, it was aimed to see whether acute weight loss (dehydration) affected self-esteem and appearance esteem in the elite wrestlers before competitions. 38 professional wrestlers who had international competition experiences and were required to be in a lower weight class because of having more than the competition weight, participated in the research voluntarily. 1st measurement 1 week before the competition, 2nd measurement during the competition morning when class determination was done in accordance with body weight were performed in the participant wrestlers prior to acute weight loss. In addition to the athletes' body weight, body mass index (BMI), "the Rosenberg Self-Esteem Scale" for the determination of their self-esteem levels and "the Appearance Esteem Scale" for the determination of self-esteem associated with appearance were used. The participant wrestlers were professional, they often lost weight before competitions and reached their goal, that's why they had positive feelings, which gave rise to increases in self-esteem and appearance esteem values after weight loss.

In conclusion, significant differences were found in body weight, BMI, self-esteem and appearance esteem values before and after weight loss (dehydration) of the wrestlers. A positive uprising was determined in the self-esteem and appearance esteem values after the wrestlers' weight loss. The participant wrestlers were professional, often experienced weight loss before competitions and had targeted weights, that's why they had positively emotional situations, which led to increases in their self-esteem and appearance esteem values.

Keywords: wrestling, weight loss, self-esteem, appearance esteem

1. Introduction

Body image is defined as "perceptions of and attitudes toward one's own physical appearance" (Phillips and DeMan, 2010). However, it is apparent that males also experience body image issues related to their weight, body shape and appearance, which can lead to detrimental, physical and emotional consequences (Schneider, Cockcroft and Hook, 2008). Grieve, Truba and Bowersox (2009) estimated that there were millions of males who experienced some levels of dissatisfaction with their body. Sociocultural and media representations of an ideal male body have changed and become more visible, pioneering males to think more critically about their bodies. A modern, ideal male body image represents to be muscular, toned, lean, physically fit, masculine, young, powerful, self-confident, and sexually desirable (Filiault, 2007). This ideal body image receives universal attention, and males who internalize this ideal body image, may experience body image dissatisfaction/distress at various levels (Grieve et al., 2009). Most females and males adolescents feel pressure to adapt to an ideal body image, particularly through exercise and fitness (McCabe and McGreevy, 2010). Self-esteem is "a certain attitude and a perception of one's self (Yorra, 2014). According to Mc Clure et al., (2010) self-esteem, as an overall reflection of an individual's self-worth, encompasses beliefs about oneself as well as an emotional response to those beliefs. Representing the capacity to feel worthy of happiness and be able to successfully address life challenges, self-esteem is an important determinant of adolescent mental health and development. Rosenberg (1965) dealt self-esteem with the meaning of a person's attitude towards himself/herself and also regarding the fact whether this individual had positive thoughts about himself/herself and he/she regards

himself/herself valuable. Some researchers and theorists believe that self-esteem has some effects on self-schema formation and people's decision-making under social situations (Baron and Byrne, 1997). Generally, researches indicate that people who participate in physical exercises, have more self-esteem than those who do not participate in physical exercises (Bizman, 2002). A research shows that for both genders, body satisfaction was significantly related to self-esteem, there was a positive relationship between body satisfaction and self-esteem (Sondhaus et al., 2001). The reason for high satisfaction levels about health, appearance and physical fields in athletes is that athletes at an elite level continuously pay attention to their health, they like their bodies due to their muscular bodies (Baştuğ, 2011). In human beings, body fat and body fluid are two main sources of overweight. Stored fat in body creates weight in athletes. The physiological issue for losing weight is to dissolve body fat. Since it involves a long period, it is difficult to practice. That's why, athletes generally prefer acute dehydration (fluid loss) (Akgün, 1993). Although quick weight loss is known to have negative effects on human health, quick weight loss is more higher in competitive weight sports (judo, karate, taekwondo, boxing and wrestling, etc.) (Franchini, Brito and Artioli, 2012). In sports based on the weight category obtained with weight measurements before competitions, e.g. wrestling, many athletes are subjected to practices for losing weight in a quick way a short time before the competition weighing in order to compete in their desired weight class. Quick weight loss is usually achieved with practices such as sauna, food and fluid limitations. In wrestlers, distributions of these food/energy resources are affected, removal of metabolic wastes slows down, cellular metabolism changes (Judelson et al., 2007). Hereby, since weight losses are mostly achieved by performing the methods of food and fluid intake limitations in short time periods, this case especially leads to decreases in body fluid amount and muscle mass. Because of this, it is significant for assessing body composition to determine an athlete's physical situation during weight loss (Kukidome et al., 2008). This type of quick weight loss applied by the wrestlers bring significant objections and anxiety in terms of health (Alderman et al., 2004). In the framework of Wrestling Weight Certification (WWC) program created by NCAA for the college wrestlers in USA in 1998 to reduce weight loss in an unhealthy way, and increase safe participation in sportive activities, body fat percentage was regarded to be at the minimum level of 5% as minimum wrestling weight in the assessment of body composition before competitions and seasons for wrestlers (Clark et al., 2005). Also, in the framework of athletes' minimum weight program (WWC), NCAA made each wrestler determine dehydration situation as well as body weight and composition at the start of the season (Utter et al., 2003). In accordance with the principle of weight class in sports, one of the greatest problems for athletes is to be unable to protect their weight towards competitions (Ransone and Hughest, 2004). Therefore, when athletes lose weight a few days before the competition date, their health and success are put at risk (Ersoy, 2004). The basic factor which drives wrestlers to lose weight quickly in a short time, is to want to wrestle in the lowest weight class as far as possible in order to have competition advantages. Wrestlers use dehydration (fluid loss) methods (sauna, limitation of fluid and food intake for a long time, diuretics and diet pills) to have lower body weights in short time periods (Wroble and Moxley, 1998). Wrestlers must be involved in intensive trainings, have appropriate weights for competition programs and check body composition, because they wrestle in certain weight classes (Karl, 2009). The reason for making athletes practice in losing weight quickly before the competition weighing is that athletes consider to come into their own between the competition weighing period and the period before the competition. However, studies show that glycogen in skeleton muscles during in the recovery period of 17 hours after weight loss do not differ from the level before weight loss (Kukidome et al., 2008).

Acute weight loss is a frequent condition among athletes of individual sports. Weight loss before a competition may change the physical appearance of the athlete, and this may affect the athlete psychologically. Since the physical and psychological (self-esteem and the appearance esteem) changes resulting from weight loss can affect the performance of the athletes, the present study is believed to contributing for the scientific literature. It was tried to respond whether self-esteem and appearance esteem changed depending on quick weight loss in the wrestlers. In the light of this information, the study aimed to analyze the effect of acute weight loss on self-esteem and appearance esteem in the wrestlers.

2. Material and Method

This study focused on whether quick weight loss (dehydration) performed in wrestling competitions affected self-esteem and appearance esteem in the wrestlers. 38 professional wrestlers who had more weights than the competition weight in Ankara, İstanbul and İzmir and needed to lose weight, participated in this study. Before having acute weight loss, the wrestlers involved in the research were subjected to the 1st measurement 1 week before the competition and the 2nd measurement during the competition morning before being weighed. In addition to the athletes' body weight, body mass index (BMI), "the Appearance Esteem Scale" for determining self-value regarding appearance and "the Rosenberg Self-Esteem Scale" for determining self-esteem levels were used.

Body Weight and Height : As weight was measured with an electronical weighing machine at 0.1 kg sensitivity, height was measured with a digital height measuring instrument at 0.01 cm sensitivity.

Body Composition: To determine body composition, BMI was estimated with the weight / height² (kg / m²) formula (WHO, 2014).

Rosenberg Self-Esteem Scale was developed by M. Rosenberg in 1965. This scale measuring self-esteem can be applied in a group and adolescent ones. There is no time limitation about practices. The scale consisting of total 63 items has 12 sub-dimensions. These are: 1- Self-Esteem, 2- Sustainability of Self Concept, 3- Trust in People, 4- Sensitivity to Criticism, 5- Depressive Affectivity, 6- Fancifulness, 7- Psychotic Symptoms (regarded as anxiety indicator), 8- Threat Feel in Interpersonal Relations, 9- Degree for Participating in Discussions, 10- Mother-Father Relation, 11- Relation with Father, 12- Psychic Isolation. In this study, the self-esteem sub-category consisting of 10 items was used. The scale was translated from English to Turkish by Çuhadaroğlu (1986), and its reliability-validity trials were done. The Rosenberg Self-Esteem Scale is made up of twelve sub-categories which have multiple choices. The self-esteem sub-scale of this scale was used in the study. The scale with 10 items ranges from 10 to 40, where the higher scores from the scale indicate lower self-esteem. The Rosenberg Self-Esteem Scale is a mostly-used test (Cramer, 2003; De Man, Gutierrez and Sterk, 2001; Dooley and Prause, 1995; Flett and Blankstein, 1994; Wade, 2000) which has well-established reliability and validity coefficients. Various researchers found reliability coefficients of the Rosenberg Scale between 0.83 (Utsey et al., 2000) and 0.91 (Berms and Lloyd, 1995). The Turkish translation and reliability studies of the scale were conducted by Çuhadaroğlu (1986). The test-retest reliability for the Turkish version of the scale was estimated to be 0.75 by Çuhadaroğlu (1986), 0.82 by Kartal (1996) and the Cronbach alpha reliability of the scale was found 0.76, 0.85 by Kartal (1996), Sümer and Güngör (1999). As for validity, the correlation between the Symptom Check Lists Revised (SCL-90-R) was computed. The correlations of Rosenberg Self-Esteem Scale with the the three subscales of SCL-90-R were 0.45, 0.66 and 0.70. (the sub-scales of threat perception in interpersonal relationships, depression and psychotic symptoms, respectively (Çuhadaroğlu, 1986).

The Appearance Esteem Scale consists of 10 attitudinal statements about self which are specific to one's opinions of his/her physical appearance, and the responses are given on a 4-point Likert type scale on which; 1 implies "Completely Agree" and 4 implies "Completely Disagree". The negatively worded items are reverse to calculate all items in the same direction. The scale with 10 items ranges from 10 to 40, where the lower scores from the scale indicate higher body satisfaction. The Appearance Esteem Scale was developed by Kartal (1996), with six items of the Appearance Self-Esteem Scale (Pliner, Chaiken and Flett, 1990) and five items of the Self-Rating Scale (Fleming and Courtney, 1984). The Appearance Esteem Scale sample was translated into Turkish version as a reliable and valid one. The test-retest reliability of the scale was 0.77, and the Cronbach Alpha reliability coefficient was 0.86. As for the criterion validity, the correlation between the Semantic Differential Self-Esteem Scale and the Appearance Esteem Scale was 0.44.

2.1 Statistical Analysis

Within this study, arithmetical averages, standard deviations, mean values, the lowest and highest values concerning the participants' age, height, weight and BMI values were estimated. To evaluate whether the relevant data complied with a normal distribution, the Kolmogorov - Smirnov Test was used. Seeing that data showed a normal distribution, the Dependent Sample t-Test (Paired Sample t-Test) was benefited from to compare the relevant average values in two different situations for a dependent variable. Statistical analyses were done with the SPSS 20.0 package program in the 95% confidence interval at the 0.05 error level.

3. Results

Table 1. The Participants' Descriptive Statistics Before and After Acute Weight Loss

Variables	The Lowest	The Highest	Arithmetical Average	Standard Deviation	Mean
Age (years)	16	31	19.16	3.2	18
Height (cm)	1.53	1.88	1.72	0.07	1.73
Body Weight Before Weight Loss (kg)	54	125	74.45	16.01	71
Body Weight After Weight Loss (kg)	50	120	70.2	16.56	66
BMI Before Weight Loss (kg/m ²)	19.8	40.8	24.8	4.02	23.9
BMI After Weight Loss (kg/m ²)	18.3	39.1	23.39	4.17	22.1

At Table 1, the participants' descriptive statistics were seen. The number of observations for all parameters was 38.

Table 2. The Comparison of The Participants' Body Weights Before and After Acute Weight Loss

Variable	Measurement	n	X	Sd	t	p
Weight (kg)	Before Weight Loss	38	74.45	16.01	9.969	0.000*
	After Weight Loss	38	70.26	16.56		

* $p < 0.05$

As seen at Table 2, there were significant differences between their body weight values before and after weight loss (dehydration) of the wrestlers took part in the research ($p < 0.05$). While the average value was 74.45 ± 16.01 before weight loss, it was determined as 70.26 ± 16.56 after weight loss.

Table 3. The Comparison of The Participants' BMI Values Before and After Acute Weight Loss

Variable	Measurement	n	X	Sd	t	p
BMI (kg/m ³)	Before Weight Loss	38	24.8	4.02	9.927	0.000*
	After Weight Loss	38	23.3	4.17		

* $p < 0.05$

Looking at Table 3, there were significant differences between their BMI values before and after weight loss (dehydration) of the wrestlers ($p < 0.05$). While the BMI average value was 24.8 ± 4.02 before weight loss, the BMI average value was regarded as 23.3 ± 4.17 after weight loss.

Table 4. The Comparison of the Participants' Esteem and Appearance Esteem Values Before and After Acute Weight Loss

Variables	Measurement	n	X	Sd	t	p
Esteem	Before Weight Loss	38	22.95	2.34	-6.378	0.000*
	After Weight Loss	38	25.84	2.67		
Appearance Esteem	Before Weight Loss	38	24.34	2.77	-5.291	0.000*
	After Weight Loss	38	27.92	3.20		

* $p < 0.05$

As seen at Table 4, there were significant differences between self-esteem and appearance esteem values before and after weight loss (dehydration) of the wrestlers ($p < 0.05$). While their self-esteem average value was 22.95 ± 2.34 before weight loss, the average value was 25.84 ± 2.67 after weight loss. As the average value of appearance esteem was 24.34 ± 2.77 before weight loss, it was estimated to be 27.92 ± 2.77 after weight loss. Among the wrestlers there was a positive increase in self-esteem and appearance esteem values after weight loss.

4. Discussion and Conclusion

In this research dealing with the effect of acute weight loss on self-esteem and appearance esteem in the wrestlers, there was a significant difference between body weight values before and after weight loss (dehydration) of the wrestlers participated in the research. As the average value was 74.45 ± 16.01 before weight loss, it was 70.26 ± 16.56 after weight loss (Table 2). Since wrestling sport is a sport based on weight categories, this gives rise to lose weight in athletes at large amounts in short time periods toward competitions (Oppliger and Bartok, 2002). The main factor which forces the wrestlers for this situation, is that they want to wrestle at the lowest weight class as far as possible to have competition advantages (Kiningham and Gorenflo, 2001). Oppliger et al., (2003) observed that 80% of the college wrestlers were interested in dieting, more than 50% fasted and approximately 75% increased their training load to lose weight. Demirkan et al., (2011) also found that although relevant quick weight loss and dehydration in the cadet wrestlers just prior to weighing were followed by quick weight gain between weighing and the competition; there was no improvement in the hydration situation.

Significant differences were found between BMI values of the participant wrestlers before and after weight loss (dehydration). As their BMI average value was 24.8 ± 4.02 after weight loss, their BMI average value was 23.3 ± 4.17 after weight loss (Table 3). Body composition profile is a fundamental component of physical feasibility. Characteristics of appropriate body composition make contributions to the development of physical feasibility at an optimal level (Mayooran, Attygalla and Subasinghe, 2014). The potential damages on physiological parameters resulting from weight loss and the changes in body composition during a competition season have been studied and conflicting results were found (Schmidt et al., 2005). Alpay et al., (2015) determined that there were not statistically significant differences in the demographic variables (age, height, weight and BMI) between the group that lost weight and the one that did not achieve in it.

Significant differences were also found between the self-esteem and appearance esteem values before and after weight loss (dehydration) of the wrestlers participated in the research. While their self-esteem average value was 22.95 ± 2.34 before weight loss, the average value was 25.84 ± 2.67 after weight loss. As the average value of appearance esteem was 24.34 ± 2.77 before weight loss, it was 27.92 ± 2.77 after weight loss. A positive advancement was observed in the self-esteem and appearance esteem values after weight loss among the wrestlers. It is considered that when athletes compete in a lower weight class than a normal weight class by losing weight, this one increases motivation for success,

when they are involved in targeted weight class, this one makes athletes have self-confidence and psychological relief. Here, the participant wrestlers were professional, they often experienced in losing weight before competitions and achieved in their targets, so their positive feelings let their self-esteem and appearance esteem values increase after weight loss (Table 3). Experienced athletes' satisfaction points from body images were higher than unexperienced ones (Koca, Aşçı and Oyar, 2003). Baştuğ and Kuru (2009) claimed that athletes liked their skills more when their sportive performance year increased, acquired skills became excellent in time, also, ones doing sport at an elite level liked their bodies more due to their well-built development when time passed. Baştuğ (2011) said that athletes' body perception levels were examined, the features of physical competence orientation, health orientation, appearance evaluation, fitness evaluation, health evaluation and body areas satisfaction were found to be higher than non-athletes'. Athletes care about health, appearance and physical competence, are satisfied with their body parts because of their muscular body structures developing due to exercises, and they have flexible personality to show feminine and masculine features that the environment needs in terms of gender roles. Barlett, Vowels and Saucier, (2008) reported that pressure from the mass media was related to body satisfaction, body esteem, self-esteem, psychological disorders (e.g., depression) and behavioral outcomes (e.g., excessive exercises). Vartanian et. al., (2012) suggested that appearance-based motives for exercises and weight loss were associated with negative outcomes. Efforts to promote exercises and weight control should emphasize health benefits rather than implications of appearance. Samadzadeh et al., (2011) found that there was a significant difference among the study groups in self-esteem, sensation seeking and mental health. The professional athletes had the highest self-esteem, sensation seeking and mental health values. Studies have revealed that attendance in physical activities such as individual and cooperative sports have positive effects on self-esteem (Fletcher, 2009; Bowker, 2008). Karagöz and Karagün (2015) studied body image of the professional athletes and determined a significant relation between body image and variables of gender and sport branch. Marttinen et al., (2011) suggested that wrestlers having quick mass loss had lack of psychological functions without being affected on grip strength or lower-body power. The findings of this research are similar to our research.

In conclusion, there were significant differences in body weight, BMI, self-esteem and appearance esteem values before and after the wrestlers' weight loss (dehydration). Among the wrestlers, there was a positive advancement in their esteem and appearance esteem values after weight loss. By losing weight, athletes make competition in a lower weight class than a normal weight class, which increases achievement motivation, which they achieve in the targeted weight class, this provides self-esteem and psychological relief in the athletes. The participant wrestlers were professional, they often lost weight before competitions and reached their goal, that's why, they had positive feelings, which gave rise to increases in their self-esteem and appearance esteem values after weight loss.

References

- Akgün, N. (1993). Egzersiz Fizyolojisi (4. baskı). GSGM Yayınları, Ankara.
- Alderman, B. L., Daniel, M., Landers, J. C., & Scott, J. R. (2004). Factors related to rapid weight loss practices among international-style wrestlers. *Medicine & Science in Sports & Exercise*, 36(2), 249-252.
- Alpay, B. C., Ersöz, Y., Karagöz, Ş., & Oskouei, M. M. (2015). A comparison of weight loss, body composition and some mineral levels before competition in elite wrestlers. *International Journal of Science Culture and Sport*, 4, 338-347.
- Barlett, C. P., Vowels, C. L., & Saucier, D. A. (2008). Meta-analyses of the effects of media images on men's body-image concerns. *Journal of Social and Clinical Psychology*, 27(3), 279-310. <http://dx.doi.org/10.1521/jscp.2008.27.3.279>
- Baron, R. B., & Byrne, D. (1997). *Social Psychology: Understanding Human Interaction* (5th ed). Boston.
- Baştuğ, G. (2011). The study of athletes' body perception and gender role. *Collegium Antropologicum*, 35(4), 1037-1043.
- Baştuğ, G., & Kuru, E. (2009). Bayan sporcuların bedenlerini algılama düzeyleri ve cinsiyet rolleri üzerine bir araştırma. *Gazi Üniversitesi, Gazi Eğitim Fakültesi Dergisi*, 29(2), 533-555.
- Bizman, Y., & Union, R. (2002). Engaging in distancing tactics among sport fan effect of self-esteem and emotional responses. *Psychology*, 142, 92-381. <http://dx.doi.org/10.1080/00224540209603906>
- Bowker, A. (2008). The relationship between sports participation and self-esteem during adolescence. *Canadian Journal of Behavioural Science*, 38.
- Brems, C., & Lloyd, P. (1995). Validation of the MMPI-2 low self-esteem content scale. *Journal of Personality Assessment*, 65(3), 550-556. http://dx.doi.org/10.1207/s15327752jpa6503_13
- Clark, R. R., Bartok, C., Sullivan, J. C., & Schoeller, D. A. (2005). Is leg to-leg BIA valid for predicting minimum

- weight in wrestlers?. *Med. Sci. Sports Exerc.*, 37(6), 1061-1068.
- Cramer, D. (2003). Facilitativeness, conflict, demand for approval, self-esteem and satisfaction with romantic relationships. *Journal of Psychology*, 137(1), 85-99. <http://dx.doi.org/10.1080/00223980309600601>
- Çuhadaroğlu, F. (1986). Adölesanlarda Benlik Saygısı. Uzmanlık Tezi, Hacettepe Üniversitesi Tıp Fakültesi Psikiyatri Anabilim Dalı, Ankara.
- De Man, A. F., Becerril, G. B. I., & Sterk, N. (2001). Stability of self-esteem as moderator of the relationship between level of the self-esteem and depression. *North American Journal of Psychology*, 3(2), 303-308.
- Demirkan, E., Koz, M., Arslan, C., Ersöz, G., & Kutlu, M. (2011). The monitoring of weight fluctuation and hydration status in cadet wrestlers (ages 14-17) during a training camp period leading up to competition. *International Journal of Wrestling Science*, 1(2), 12-18. <http://dx.doi.org/10.1080/21615667.2011.10878925>
- Dooley, D., & Prause, J. (1995). Effect of unemployment on school leavers' self-esteem. *Journal of Occupational and Organizational Psychology*, 68(3), 177-193. <http://dx.doi.org/10.1111/j.2044-8325.1995.tb00580.x>
- Ersoy, G. (2004). Egzersiz ve Spor Yapanlar için Beslenme (3. Baskı). Nobel Yayıncılık, Ankara.
- Filiault, S. M. (2007). Measuring up in the bedroom: Muscle, thinness, and men's sex lives. *International Journal of Men's Health*, 6, 127-142. <http://dx.doi.org/10.3149/jmh.0602.127>
- Fleming, J. S., & Courtney, B. B. (1984). The dimensionality of self-esteem: II. hierarchical facet model for revised measurement scales. *Journal of Personality and Social Psychology*, 46(2), 404-421.
- Fletcher, P., & Nickerson, K. W. (2009). Structured leisure activities in middle childhood: Links to well-being. *Journal of Community Psychology*, 31, 641-659. <http://dx.doi.org/10.1002/jcop.10075>
- Flett, G. L., & Blankstein, K. R. (1994). Depression, self-esteem, and complex attributions for life problems. *Current Psychology*, 13(3), 263-281. <http://dx.doi.org/10.1007/BF02686853>
- Franchini, E., Brito, C. J., & Artioli, G. G. (2012). Weight loss in combat sports: Physiological, psychological and performance effects. *Journal of the International Society of Sports Nutrition*, 9(1), 52.
- Grieve, F. G., Truba, N., & Bowersox, S. (2009). Etiology, assessment, and treatment of muscle dysmorphia. *Journal of Cognitive Psychotherapy: An International Quarterly*, 23, 306-314. <http://dx.doi.org/10.1891/0889-8391.23.4.306>
- Haskell, W. L., Lee, I. M., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., et al. (2007). Physical activity and public health: Updated recommendations for adults from the American College of Sports Medicine and the American Heart Association. *Circulation*, 116, 1081, 1093. <http://dx.doi.org/10.1249/mss.0b013e3180616b27>
- Judelson, D. A., Maresh, C. M., Anderson, J. M., Armstrong, L. E., Casa, D. J., Kraemer, W. J., ... (2007). Hydration and muscular performance: Does fluid balance affect strength, power and high-intensity endurance?. *Sports Med*, 37(10), 907-921. <http://dx.doi.org/10.2165/00007256-200737100-00006>
- Karlı, Ü. (2006). Elit Düzey Güreşçilerde Vücut Kompozisyonunun İncelenmesi. Doktora Tezi, Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü, Ankara.
- Kartal, Ş. (1996). Obesity and Its Psychological Correlates: Appearance-esteem, Self-esteem and Loneliness. Unpublished Master Dissertation, Middle East Technical University, Ankara.
- Kiningham, R. B., & Gorenflo, D. W. (2001). Weight loss methods of high school wrestlers. *Nutrition Research Newsletter*, 33(5), 810- 813.
- Koca, C., Aşçı, F. H., & Oyar, Z. (2003). Elit sporcularda denetim odağı ve fiziksel benlik algısının cinsiyete, yapılan spor branşına ve spor deneyimine göre karşılaştırılması. *Gazi Beden Eğitimi ve Spor Bilimleri Dergisi*, 8, 3-12.
- Kukidome, T., Shirai, K., Kubo, J., Matsushima, Y., Yanagisawa, O., Homma, T., & Aizawa, K. (2008). MRI evaluation of body composition changes in wrestlers undergoing rapid weight loss. *Br. J. Sports Med.*, 242(10), 514-518. <http://dx.doi.org/10.1136/bjism.2007.044081>
- Marttinen, R. H. J., Judelson, D. A., Wiersma, L. D., & Coburn, J. W. (2011). Effects of self-selected mass loss on performance and mood in collegiate wrestlers. *J. Strength Cond. Res.*, 25(4), 1010-1015.
- Mayooran, S., Attygalla, R. K., & Subasinghe, S. M. R. S. (2014). Comparison of body composition between children of urban and rural areas: A study among school children in central province of Sri Lanka. *European International Journal of Applied Science and Technology*, 1(3), 118-129.
- McCabe, M. P., & McGreevy, S. (2010). The role of partners in shaping the body image and body change strategies of adult men. *Health*, 2, 1002-1009. <http://dx.doi.org/10.4236/health.2010.29148>

- McClure, A. C., Tanski, S. E., Kingsbury, J., Gerrard, M., & Sargent, J. D. (2010). Characteristics associated with low self-esteem among US adolescents. *Academic Pediatrics, 10*(4), 238-244.
- Oppliger, R. A., Steen, S. A., & Scott, J. R. (2003). Weight loss practices of college wrestlers. *Int. J. Sport Nutr. Exerc. Metab., 13*(1), 29-46. <http://dx.doi.org/10.1123/ijsnem.13.1.29>
- Oppliger, R., & Bartok, C. (2002). Hydration testing of athletes. *Sports Medicine, 15*, 952.
- Phillips, N., & DeMan, A. F. (2010). Weight status and body image satisfaction in adult men and women. *North American Journal of Psychology, 12*, 171-183.
- Pliner, P., Chaiken, S., & Flett, G. L. (1990). Gender differences in concern with body weight and physical appearance over the life span. *Personality and Social Psychology Bulletin, 16*(2), 263-273.
- Ransone, J., & Hughest, B. (2004). Body-weight fluctuation in collegiate wrestlers: Implications of the national collegiate athletic association weight-certification program. *Journal Of Athletic Training, 39*(2), 162.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press, New Jersey.
- Samadzadeh, M., Abbasi, M., & Shahbazzadegan, B. (2011). Comparison of sensation seeking and self-esteem with mental health in professional and amateur athletes, and non-athletes. *Procedia Social and Behavioral Sciences, 15*, 1942-1950. <http://dx.doi.org/10.1016/j.sbspro.2011.04.032>
- Schmidt, W. D., Piencikowski, C. L., & Vandervest, R. E. (2005). Effects of a competitive wrestling season on body composition, strength, and power in National Collegiate Athletic Association Division III College Wrestlers. *J. Strength Cond. Res., 19*(3), 505-508.
- Schneider, V., Cockcroft, K., & Hook, D. (2008). The fallible phallus: A discourse analysis of male sexuality in a South African men's interest magazine. *South African Journal of Psychology, 38*, 136-151. <http://dx.doi.org/10.1177/008124630803800108>
- Sondhaus, E. L., Kurtz, R. M., & Strube, M. J. (2001). Body attitude, gender and self-concept: A 30 year perspective. *The Journal of Psychology, 135*(4), 413-429. <http://dx.doi.org/10.1080/00223980109603708>
- Sümer, N., & Güngör, D. (1999). Yetişkin bağlanma stilleri ölçeklerinin Türk örnekleme üzerinde psikometrik değerlendirmesi ve kültürler arası bir karşılaştırma. *Türk Psikoloji Dergisi, 14*(43), 71-106.
- Utsey, S. O., Ponterotto, J. G., Reynolds, A. L., & Cancelli, A. A. (2000). Racial discrimination, coping, life satisfaction and self-esteem among African Americans. *Journal of Counseling and Development, 78*(1), 72-81. <http://dx.doi.org/10.1002/j.1556-6676.2000.tb02562.x>
- Utter, A. C., Goss, F. L., Swan, P. D., Harris, G. S., Robertson, R. J., & Trone, G. A. (2003). Evaluation of air displacement for assessing body composition of collegiate wrestlers. *Med. Sci. Sports Exerc., 35*(3), 500-505.
- Vartanian, L. R., Wharton, C. M., & Green, E. B. (2012). Appearance vs. health motives for exercise and for weight loss. *Psychology of Sport and Exercise, 13*, 251-256. <http://dx.doi.org/10.1016/j.psychsport.2011.12.005>
- Wade, T. J. (2000). Evolutionary theory and self-perception: Sex differences in body esteem predictors of self-perceived physical and sexual attractiveness and self-esteem. *International Journal of Psychology, 35*(1), 36-45. <http://dx.doi.org/10.1080/002075900399501>
- WHO (2012). From <http://www.who.int/mediacentre/factsheets/fs311/en/index.html> (Retrieved on 28 February 2014).
- Wroble, R. R., & Moxley, D. P. (1998). Acute weight gain and its relationship to success in high school wrestlers. *Med. Sci. Sports Exerc., 30*(6), 949-951. <http://dx.doi.org/10.1249/00005768-199806000-00026>
- Yorra, M. L. (2014). Self-efficacy and self-esteem in third-year pharmacy students. *American Journal of Pharmaceutical Education, 78*(7).

