



The Effects of CrossFit, Pilates and Zumba Exercises on Body Composition and Body Image of Women

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Abstract

Aim: The purpose of this study was to investigate body composition and body image of women doing CrossFit, Pilates and Zumba exercises.

Material and Methods: This study was carried out to investigate body composition and body areas satisfaction of women doing CrossFit, Pilates and Zumba exercises, 80 women voluntarily being in an average age of 42.74±8.47 voluntarily participated in the research. The women were grouped into two such as experimental (n=45) and control (n=35). The women in experimental group were applied 30-70min mixed exercises (CrossFit, Pilates, Zumba) for 4 days in a week throughout 12 weeks to have target heart rate of 50-60%.

Results: A significant difference was found between body weight and BMI pre-test and post-test values of women who were applied mixed exercise program (CrossFit, Pilates, Zumba). There was a decrease in both body weight and average means of BMI of women. A significant difference was found between body areas satisfaction pre-test and post-test values of women who were applied CrossFit, Pilates, Zumba exercise program. While pre-test value of body areas satisfaction of women who were applied mixed exercise program was determined as 31.68±6.11, its post-test value was 35.68±5.02. It is remarkable that while body weight and BMI of women doing exercises decreased, their body areas satisfaction values increased. It was indicated that the body areas satisfaction of women having weight loss increased. A significant difference was not found between body weight, BMI and body areas satisfaction pre-test and post-test values of women in control group.

Conclusion: It was concluded that there were positive effects on body weight, BMI and body image.

Keywords

Women,
Body Areas Satisfaction,
Body Composition,
Body Image,

Article Info

Received: 29.12.2015
Accepted: 16.02.2016
Online Published: 01.03.2016

DOI: 10.18826/ijsets.25037

INTRODUCTION

Body image is a multifaceted psychological experience relating to physical appearance and self-perceptions and attitudes encompassing perceptual, affective, cognitive and behavioural aspects (Cash, 2004). Body image is defined as “how a person feels about his appearance”. Developing and nurturing a positive body image is considered part of a healthy mental attitude and is crucial to a person’s happiness and wellness. Body image is a combination of how we perceive ourselves about basic looks and how we react emotionally in certain situations (Sloan, 2000). The appearance of body dissatisfaction within an individual stems predominantly from sociocultural influences including but not limited to advertisements, magazines, television, peers, and family (Guimerà et al., 2010; Schooler & Trinh, 2011). Body image dissatisfaction is related to a perceived lack of muscle in men and to a perceived excess weight in women (Cafri & Thompson, 2004). Research has indicated that more women are struggling with their views of their body image, and have found a link between low body esteem and higher incidents of depression (Carpenter et al., 2000). Research has found that women tend to compare themselves to media images, and this comparison has contributed to the quest for the perfect body type. It was also found that those who failed to live up to the body images they thought were perfect experienced higher levels of depression (Van den Berg et al., 2007). As the search and pining for the perfect body type increases, more and more women and girls are beginning to suffer from serious eating disorders. Unfortunately, as the eating disorders worsen, so does the depression (Ivarsson et al., 2000). Depression can later worsen to the extent that women with eating disorders attempt to commit suicide (Pompili et al., 2006). Hasanpour and Naderi (2007) in a study of depressed

The role and contributions of each authors as in the section of IJSETS Writing Rules “Criteria for Authorship” is reported that:

1. Author: 1,4,5,6,7,8 2. Author: 2,8 3. Author: 2,8 4. Author: 3,8

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girls, showed the significant effects of 8 week-aerobic exercises on depression and academic achievement. They showed that aerobic exercises can impact on reducing depression and improving academic performance. Research results indicated that sport and physical training not only improve social skills but, also affect persons` physical psychological health and their social compatibility (Bruce et al., 2008). Rothon et al. (2010) by reviewing the relation between physical activity and depression among east London adolescent boys and girls show that participating in sport activities can reduce depression among adolescents. In addition to its benefits to physical health, many studies indicate that participating in physical activity can also have positive effects on psychological health, such as reducing risk or symptoms of depression (Teychenne, 2008). In a recent review (Azar et al., 2008), it was found that physical activity reduces depressive symptoms and even low levels of activity can prevent symptoms among young women. While, we have a clearer understanding on the association between physical activity and depressive symptoms among young women, the underlying factors that influence physical activity behaviour in these women compared to women without symptoms are unknown. To increase physical activity participation among young women with depressive symptoms, it is important to identify modifiable influences on these behaviours. In addition, a negative body image can potentiate depression, disordered eating, habitual body monitoring, social anxiety, sexual difficulties, and low self-esteem. Furthermore, reduction in self-efficacy because of weight fluctuation may add to feelings of depression (Schwartz and Brownell, 2004). In a society that is filled with the “perfect body type” it is no wonder that many women are unhappy with their own body image. Current research has indicated that more women are struggling with their views of their body image, and have found a link between low body esteem and higher incidents of depression (Carpenter et al., 2000). In another review study performed by Aladro-Gonzalvo et al., (2012), it was emphasized that there was not enough exact experimental information about the effect of Pilates exercises on body composition. Moreover, Pilates, is one of the most popular exercises among women in terms of properties such as decrease in body weight and ratio of waist-hip, body tightening. It was also determined that Pilates exercise has positive effects on body composition (García and Lain, 2011; Singh and Singh, 2014). Zumba, on the other hand, is an exercise with dance which is applied by millions of people all over the world and has many potential benefits found in the researches (Delextrat et al., 2015). Zumba Fitness (or Zumba) is being promoted by fitness industries as an intensive cardiovascular exercise to help people loose excess weight (Lopez; 2013; Sugar, 2014). However, as admitted by Luetngen et al., (2012), despite its widespread popularity, scientific research documenting the potential health benefits of this dance form of exercises is scant (Luetngen et al., 2012). Every year new exercise programs are being developed in order to help promote physical fitness. CrossFit training has become a popular form of exercise in the past couple of years and has even developed into a competitive sport. CrossFit is an exercise training program that aims to improve fitness through the utilization of a constant variety of functional movements (Glassman, 2007). This CrossFit-based, high-intensity interval training (HIIT) has been used as an alternative to traditional endurance training for the improvement of aerobic fitness. HIIT is practical for many individuals due to the minimal time commitment required when compared to traditional continuous endurance training. A relatively new variation of HIIT has recently become popular and incorporates high intensity resistance training using varied, multiple joint movements. This high intensity power training (HIPT) may also offer improvement of aerobic fitness with minimal time commitment compared to traditional aerobic training. The sustained high power output associated with HIPT might serve as a stimulus for positive adaptations of maximal aerobic capacity (VO_2max) and body composition. While HIIT has been shown to improve body composition and VO_2max in healthy adults, it is not clear if HIPT could offer these same benefits (Tremblay et al., 1994; Trilk et al., 2011). It was indicated in the study of Smith et al., (2013) that CrossFit-based, high intensity power training improves maximal aerobic fitness and body composition, as well as CrossFit exercise positively affects body fat rate, oxygen capacity, body weight and body composition. Nowadays, CrossFit, Pilates, Zumba exercises are very popular among women in terms of their properties such as weight loss and body tightening. Dependently, this study is very important. The aim of this study was to investigate body composition and body areas satisfaction of women doing CrossFit, Pilates, and Zumba exercises.

METHOD

Participants: In the study carried out to investigate body composition and body areas satisfaction of women doing CrossFit, Pilates and Zumba exercises, 80 women being in an average age of 42.74 ± 8.47 years voluntarily participated. The women were grouped into two such as experimental ($n=45$) and control ($n=35$).

Procedure: The women in experimental group were applied 30-70 min mixed exercises (CrossFit, Plates, Zumba) for 4 days in a week throughout 12 weeks to have target heart rate of 50-60%. The intensity of exercises was determined via Karvonen method (Zorba and Saygın, 2013). At the beginning and end of the study, the measurements directed towards body weight (kg), BMI (kg/m^2) and body areas satisfaction of women were taken. "Body Areas Satisfaction Scale" sub-dimension of the Multidimensional Body-Self Relations Questionnaire (MBSRQ; Cash, 2000) was used to measure body areas satisfaction of women. SPSS program was used for the analysis of the data and Paired t test analysis was carried out.

Measurements

Body weight and height: The weight was measured by an electronic balance with 0.1kg sensitivity while the height was measured via digital height meter device with 0.01cm sensitivity.

Body composition: In order to determine body composition, body mass index (BMI) was calculated via $\text{weight}/\text{height}^2$ (kg/m^2) formula (WHO, 2014).

A typical CrossFit workout consists of a warm-up phase, a skill or strength development phase, then a "Workout of the Day" (WOD). Each CrossFit WOD design varies from day to day, but is a combination of exercises done at a high-intensity for a duration anywhere from 5 to 20 minutes. CrossFit training includes rowing, sprinting, powerlifting, gymnastics, calisthenics, and weight lifting, but it is not limited to just these exercises (Glassman, 2002; Glassman, 2007). Two of the main methods combined to form a CrossFit workout are high-intensity interval training (HITT) and circuit weight training (CWT). HITT involves performing repeated bouts of "all-out" exercise, with short rest periods between bouts. The high-intensity segments are performed relatively close to maximal oxygen consumption (VO_2 max) (Gibabla & McGee, 2008). CWT involves performing resistance-training exercise for a given period of time (e.g., 30sec) and then moving on to the next exercise with minimal rest between exercise (e.g., 30 seconds) (Rixon, Rehor & Bemben, 2006). The resistance used for CWT is usually 40-70% of 1 repetition maximum (RM) and individuals perform as many repetitions as possible during the 30-second work segment.

In Pilates mat exercises, exercises aimed at strengthening all core muscles, muscles around hips, dorsal muscles, pectoral muscles such as "shoulder bridge (1-2)", "corkscrew", "roll-up", "roll down", "clam (1-2)", "side kick (1-2)", "staggered legs", "scissors (1-2)", "swimming" (facedown and), "swan dive (1-2)", "breast stroke preparation", "abdominal preparation", "oblique preparation" were included and the program was completed via stretching exercises on foot and on mat (Bastug et al., 2014).

Zumba is a dance which combines Aerobic with music, figures of Oriental and Latin (merengue, salsa, bachata, reggae ton) dances (Micallef, 2014). Zumba exercises were carried out for 15-20 minutes after CrossFit and Pilates exercises for 4 days throughout 12 weeks. Zumba program was performed at low levels to make exercise program of women more entertaining.

The "Multi-dimensional Body-Self Relations Questionnaire (MBSRQ) - Body Areas Satisfaction Scale," which was developed by Winstead and Cash (1984) and of which reliability and validity studies were carried out by Dogan and Dogan (1992) was used to determine the level of body self-perception of the women in the pre-test - post-test measurements. This questionnaire uses 7 subscales to evaluate peoples' attitudes about their bodies based on evaluation of themselves, their appearance, their fitness, and how healthy they believe themselves to be (Cash, 2000). The Multi-dimensional Body-Self Relations Questionnaire has 7 scales: 1. Appearance Evaluation, 2. Appearance Orientation, 3. Fitness Evaluation, 4. Fitness Orientation, 5. Health Evaluation, 6. Health Orientation, 7. Body Areas Satisfaction. The reverse expressed items are as follows: 12, 13, 14, 25, 26, 27, 29, 30, 31, 33, 35, 37, 39, 40, 41. The total score of a subject in the items of the questionnaire shows his total questionnaire score. The minimum score is 57 and the maximum score is 285 in the Turkish version of

the Questionnaire. Alpha internal consistency coefficients of sub-groups vary between 0.72 and 0.81 for all subjects (Dogan and Dogan, 1992).

RESULTS

Table 1. Arithmetic mean of age and height with standard deviation values belonging to experimental and control groups

Variables	Experimental group (N=45)	Control Group (N=35)
Age (years)	39.97±8.13	45.28±8.38
Body Height (cm)	163±4.82	161±4.93

Table 2. Body weight (kg) and body mass index (kg/m²) pre-test (X±SS) and post-test (X±SS) results of women participated in the research as experimental and control groups.

Variables	Experimental Group (n=45)				Control Group (n=35)			
	Pre-Test	Post-Test	t	p	Pre-test	Post-test	t	p
Body weight(kg)	67.13±9.72	65.64±9.49	3.28	0.00*	66.60±7.43	66.42±11.19	0.12	0.90
Body mass index (kg/m ²)	25.15±3.78	24.59±3.71	3.35	0.00*	25.63±2.86	25.60±4.64	0.05	0.96

*p < 0.01

As it can be seen in Table 2, a significant difference was found between body weight and BMI pre-test and post-test values of women who were applied CrossFit, Pilates, Zumba (mixed) exercise program (p<0.01). While pre-test value of body weight belonging to women who were doing mixed exercises (CrossFit, Pilates, Zumba) was 67.13±9.72, its post-test value was found as 65.64±9.49. It was determined that BMI pre-test value of women who were doing mixed exercises was 25.15±3.78 whereas its post-test value decreased to 24.59±3.35. A decrease was observed in both body weight and average means of BMI of women. Moreover, a significant difference was not found between pre-test and post-test values of body weight and BMI of women in control group.

Table 3. Body Areas Satisfaction pre-test (X±SS) and post-test (X±SS) results of women participated in the research was experimental and control groups

Variables	Experimental group (n=45)				Control group (n=35)			
	Pre-Test	Post-Test	t	p	Pre-Test	Post-Test	t	p
Body areas satisfaction	31.68±6.11	35.68±5.02	-8.29	0.00*	27.05±7.41	27.45±6.83	-1.06	0.30

*p<0.01

As it can be seen in Table 3, a significant difference was found between body areas satisfaction pre-test and post-test values of women who were applied mixed exercise program (p<0.01). While pre-test value of body areas satisfaction of women who were applied mixed exercise program was determined as 31.68±6.11, its post-test value was 35.68±5.02. A significant difference was not found between body areas satisfaction pre-test and post-test values of women in control group.

DISCUSSION

In this study which was aimed to investigate body composition and body areas satisfaction of women doing CrossFit, Pilates and Zumba exercises, the following findings were obtained;

A significant difference was found between body weight and BMI pre-test and post-test values of women who were applied exercise program. While pre-test value of body weight belonging to women who were doing mixed exercises (CrossFit, Pilates, Zumba) was 67.13±9.72, its post-test value was found as 65.64±9.49. It was determined that BMI pre-test value of women who were doing mixed exercises was 25.15±3.78 whereas its post-test value decreased to 24.59±3.35. A positive difference was determined in both body weight and average means of BMI of women doing CrossFit, Pilates and Zumba exercises. Moreover, a significant difference was not found between pre-test and post-test values of body weight and BMI of women in control group (Table 2). The results indicated several key themes that were unique to women with depressive symptoms. These women more often described negative physical activity experiences during their youth, more barriers to physical activity, participating in more spontaneous than planned activity, lower self-efficacy for physical activity and being influenced by their friends' and family's inactivity (Azar et al. 2010). In another study titled

with CrossFit-based high intensity power training improves maximal aerobic fitness and body composition, a decrease was determined in body fat ratio of men and women, as well as positive developments were indicated in values of VO_2 max, body weight and body composition (Smith et al., 2013). In the study which emphasizes Zumba dance improves health in overweight/obese or type 2 diabetic women, aerobic fitness and internal motivation were developed by Zumba exercise and a decrease was determined in body weight and body fat ratio of the participants (Krishan et al., 2015). In the study of Gökhan et al. (2014), it was informed that Pilates studies of 2 hours for 4 days a week throughout 6 weeks had positive effects on body composition of adult women. There are also studies present in the literature indicating beneficial effects of Pilates exercises on body weight, body mass index (BMI) values, body composition and flexibility performance (Gonzalvo, Diaz and Jimenez, 2012; Fourie et al., 2013; Guimaraes et al., 2014; Singh and Singh, 2014). Baştuğ et al., (2014) reported that Pilates exercise method is one of the most important exercise in improving flexibility performance and body composition. Zumba program was applied for eight weeks on fat and obese women and weight loss was determined (Micallef, 2014). Babayigit et al., (2014) indicates that weight loss program with a step dance and aerobic dance are as useful tools as the other sports which enable to decrease body fat percentage, in improving weight for university students.

A significant difference was found between body areas satisfaction pre-test and post-test values of women who were applied CrossFit, Pilates, Zumba exercise program ($p < 0.05$). While pre-test value of body areas satisfaction of women who were applied mixed exercise program was determined as 31.68 ± 6.11 , its post-test value was 35.68 ± 5.02 . A significant difference was not found between body areas satisfaction pre-test and post-test values of women in control group (Table 3). In a study where relationship between self-respect, social appearance concern, depression and anxiety was investigated, it was observed that social anxiety level and self-respect were interrelated with each other (Özcan et al., 2013). This study was consistent with the findings that women and adolescent girls across many different nationalities including, Chinese women, Australian adolescents, and Swedish women who are more critical and judging about their body image show higher levels of depression (Ivarsson et al., 2006). In the study titled as An 8-week Exercise Intervention Based on Zumba Improves Aerobic Fitness and Psychological Well-Being in Healthy Women; it was determined that maximal aerobic fitness was (+3.6%), self-perception of physical strength was (+16.3%) and muscular development was (+18.6%), greater autonomy was (+8.0%) and purpose in life was (+4.4%). In addition, some psychological changes were significantly correlated to body fat at baseline, and changes in fitness (Delextrat et al., 2015). Body image dissatisfaction affects both sexes and it is influenced by both culture and society, including mass media images often favouring models close to those of people suffering from anorexia (Ratanasiripong and Burkey 2011). Grogan (2008) investigated body image and exercise participation of both males and females. They found that body image related with exercise participation. Adilogulları (2014) found that dance training reduces on social physique anxiety. Because dancing provides individuals opportunity to share emotions, express themselves without any word, socialize, people may find the chance to move away from anxiety and stress of everyday life while dancing. Bavli and et al., (2015) were to investigate the exercise addiction symptoms among dancers. According to their findings, the high frequency of daily exercise and the high exercise age can be effective to appear the exercise dependence among dancers.

CONCLUSION

Consequently; a significant difference was found between body weight and BMI pre-test and post-test values of women who were applied mixed exercise program (CrossFit, Pilates, Zumba). A decrease was observed in both body weight and average means of BMI of women. A significant difference was found between body areas satisfaction pre-test and post-test values of women who were applied CrossFit, Pilates, Zumba exercise program. While pre-test value of body areas satisfaction of women who were applied mixed exercise program was determined as 31.68 ± 6.11 , its post-test value was 35.68 ± 5.02 . It is remarkable that while body weight and BMI of women doing exercises decreased, their body areas satisfaction values increased. It was indicated that the body areas satisfaction of women having weight loss increased. A significant difference was not found between body weight, BMI and body areas satisfaction pre-test and post-test values of women in control group. It was concluded that CrossFit, Pilates, Zumba exercises affected body weight, BMI and body areas satisfaction positively.

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