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COMBINED EFFECT OF DANCE AND FITNESS ON WAIST HIP RATIO OF SEDENTARY FEMALES

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ABSTRACT

The ever-increasing worldwide obesity epidemic poses increased risk for coronary heart disease, hypertension, abnormal cholesterol, diabetes mellitus, sleep apnea and certain cancers. The aim of this research work was to find out the combined effect of Salsa dance and Merengue fitness form on the waist hip ratio of adult sedentary females. The study was conducted on twenty adult sedentary females aged 25 to 35 years, who were selected randomly at the time of their admission to the dance fitness program. Both dance and fitness forms were taught to the subject under proper supervision of the instructor and the room temperature was 20^{o}C, in a well-furnished fitness studio in Kolkata. Health certificates were attained prior to the study. There were a total of 36 sessions, three sessions per week; each session lasted not more than one hour. The waist-hip ratio was taken before and after the training process. It was seen that a significant difference existed between the initial and final measurement of waist hip ratio ($p<0.05$). Waist-to-hip ratio was employed for classifying obesity and the risks of abdominal fat accumulation. Hence it was concluded that the salsa and Merengue forms helped in effectively reducing the waist hip ratio which in turn may be useful in reducing the obesity range and may also help in reducing further health issues.

Keywords: *WHR, salsa, meringue, obesity.*

1. INTRODUCTION

Compared with men and other women, women have substantially more total body fat (Dufour & Slather, 2002); the effect size for the human sex difference is 2.6 at the end of puberty (Boot, Bouquet, de Ridder, Krenning, & de Muinck Keizer-Shrama, 1997). Body fat distribution is also highly dimorphic, with women having more gluteofemoral fat and less abdominal and visceral fat than men,

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resulting in lower waist-hip ratios (WHRs), with an effect size of 1.7 (Tichet, Vol, Balkau, Le Clesiau, & D'Hour, 1993). It has also been suggested that a low WHR signals better health (Marlowe, Apicella, & Reed, 2005; Singh, 1993). This claim is supported by abundant evidence indicating that higher WHRs are associated with increased morbidity and mortality (Bjorntorp, 1988). Obesity has become a serious health problem in the developed as well as developing countries. Excessive body weight is associated with various diseases, particularly cardio-vascular diseases, diabetes mellitus type 2, obstructive sleep apnea, certain types of cancer, and osteoarthritis. As a result, obesity has been found to reduce life expectancy (Hu, Manson, & Stampfer, 2001). Excess intra-abdominal fat is associated with greater risk of obesity related morbidity than in overall adiposity (Kumanyika, 1994).

Sedentary lifestyles increase all causes of mortality, double the risk of cardiovascular diseases, diabetes, and obesity, and increase the risks of colon cancer, high blood pressure, osteoporosis, lipid disorders, depression and anxiety. Fitness has thus become the need of the hour, without which life would be incomplete and health would be a matter of tension (Reilly & Dorosty, 1999). The modern approach of fitness exercise satisfies goals such as harmony of the body, improving posture and strengthening bone-joint segments of the locomotors apparatus (Carman, Sowers, Hawthorne, & Weissfeld, 1994). The researches confirm that the implementation of various forms of group fitness program contributed to statistically significant effects in improving functional and motoric abilities of a woman (Šebić, Šahat, Zuković, & Lukić, 2012), and changes in women body composition as well (Stoiljković, Mandarić, Todorović, & Mitić, 2010; Colditz, Willett, & Stampfer, 1990). Also, the latest researches separate dance fitness as the most effective group fitness program (Manson, Colditz, & Stampfer, 1990; Stoiljković *et al.*, 2010; Dufour & Slather, 2002) which through motivating music implement and creative choreography primarily aimed to entertain the trainees.

Waist circumference (WC) and waist-hip ratio (WHR) are the measures of visceral or abdominal fat mass. These measures are independent of height and muscle mass, have emerged as important predictors of risk of obesity related diseases and are thus very useful indicators of excess body fat and increased health risk. Measurements of WC and WHR are relatively simple and easier to calculate. It has been reported that WC and WHR showed significant association with myocardial infarction as compared to BMI (Welborn, Dhaliwal, & Bennett, 2003). The purpose of present study was to evaluate waist circumference (WC) and waist-hip ratio (WHR) as predictors of health risk for being overweight amongst the sedentary individuals.

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2. METHODS AND MATERIALS

2.1 Subjects

In the present study a total of 20 sedentary females aged 25 to 35 years were selected from renowned dance and fitness studios namely Twist & Turns, and Footlooz, Kolkata, West Bengal, India.

2.2 Criterion Measures

2.2.1 Waist Circumference: The WHO STEPS protocol for measuring waist circumference instructs that the measurement be made at the approximate midpoint between the lower margin of the last palpable rib and the top of the iliac crest (WHO, 2008). The United States (US) National Institutes of Health (NIH) protocol provided in the NIH Practical guide to obesity (NHLBI Obesity Education Initiative, 2000) and the protocol used in the US National Health and Nutrition Examination Survey (NHANES) III (Westat Inc, 1998) indicate that the waist circumference measurement should be made at the top of the iliac crest.

2.2.2 Hip Circumference: All of the protocols mentioned in Section 2.2.1 indicate that the hip circumference measurement should be taken around the widest portion of the buttocks.

2.2.3 Tightness and Type of Tape: The accuracy of waist and hip circumference measurements depends on the tightness of the measuring tape, and on its correct positioning (i.e. parallel to the floor at the level at which the measurement is made). The WHO STEPS protocol states that, for both waist and hip, the tape should be snug around the body, but not pulled so tight that it is constricting (WHO, 2008). The protocol also recommends the use of a stretch-resistant tape that provides a constant 100 g of tension through the use of a special indicator buckle; use of this type of tape reduces differences in tightness. Both the protocol described in NIH Practical guide to obesity (NHLBI Obesity Education Initiative, 2000) and the NHANES III protocol (Westat Inc, 1998) recommend that the measurements be made with the tape held snugly, but not constricting, and at a level parallel to the floor.

2.3 Experimental Set-up

The researchers went to the studios/fitness centres where the subjects were given clear instructions related to the experiment. The design of the experiment was

completed in three phases viz. 1) pre training phase, 2. training phase, and 3. post training phase.

2.4 Data Acquisition

In the pre training phase the subjects underwent waist hip ratio measurement. In the training phase they were given the salsa and the Meringue (combined) training (where salsa is a dance form and Meringue is Latin fitness form). The training used to last from 45 to 60 minutes thrice a week for 3 months. The researcher being a licensed fitness instructor use to train the subjects under proper guidance and care. After the completion of 3 months training program data was again obtained on the waist hip ratio with the help of the measuring tape.

Waist circumference was measured at the midpoint between the lower margin of the least palpable rib and the top of the iliac crest, using a stretch-resistant tape that provides a constant 100 g tension. Hip circumference was measured around the widest portion of the buttocks, with the tape parallel to the floor. For both measurements, the subjects stand with feet close together, arms at the side and body weight evenly distributed, and wear little clothing. It was make sure by the researchers that the subjects were at relaxed mode. The measurements were taken at the end of a normal expiration. Each measurement was repeated twice; if the measurements were within 1 cm of one another, the average was calculated.

Then the waist hip ratio (WHR) was obtained by simply dividing the waist measurement by the hip measurement. The WHO defines the ratios of >9.0 in men and >8.5 in women as one of the decisive benchmarks for metabolic syndrome (Welborn, & Dhaliwal, 2007).

2.5 Statistical Analysis

The data gathered due to the effectiveness of dance fitness training on waist hip ratio of sedentary females was analyzed using statistical software SPSS v.20. The acquired data was subjected to paired *t* test, at 0.05 level of confidence.

3. RESULTS

Table 1: Significance of mean difference of waist hip ratio due to combined effect of dance and fitness forms

Groups	Mean	S.D.	Mean Diff.	S.E. Mean	*t* value
WHR (pre)	0.86	0.05	0.07	0.003	3.26*
WHR (Post)	0.79	0.06			

*Significant at 0.05 level Tab $t_{(0.05)} = 2.09$

From the reading of the above table it is found that there is a significant difference exits between WHR pre and post data. The *t*-test employed to find the significant difference was greater than the tabulated value at 95% level of confidence ($p<0.05$). Which indicates that there is a positive effect of selected dance form and fitness on fat management.

4. DISCUSSION

The ever-increasing worldwide obesity epidemic poses increased risk for coronary heart disease, hypertension, abnormal cholesterol, diabetes mellitus, sleep apnea and certain cancers (Hainer, Toplak, & Mitrakou, 2008). The findings of the present study revealed that there was a significant effect of dance and fitness forms on the waist hip ratio of sedentary female adults. The scholars are greatly satisfied to mention that the findings have accomplished the purpose for which the study was initially conceptualized. Initially the mean waist hip ratio of the subjects was 0.86, which depicts that the average was at the verge of obesity, but after the implication of the dance fitness routine, the mean waist hip ratio came down to 0.79, which showed that there was a 0.07 difference in mean and was sufficient to say that the subjects improved in their waist hip ratio resulting in a better health status. A waist circumference 88 cm in women is associated with higher cardiometabolic risk (Ness-Abramof & Apovian, 2008). A study done by Welborn *et al.,* (2003) showed that obesity assessed by waist hip ratio is a better predictor of cardiovascular diseases and Srikanthan, Seeman, and Karlamangla (2009) confirm, and cite several other investigations that shows waist-to-hip ratio being the superior clinical measurement for predicting all cause and cardio-vascular disease mortality. Welborn and Dhaliwal (2007) add that the hip circumference indicates a lower risk for body fat accumulation, and thus including it into the waist-to-hip equation enhances the accuracy of this measurement technique. The people who carry excess weight in the middle are at a higher risk of high blood pressure. As the waist line increases so does the level of blood pressure. Thus having a desired waist hip ratio is essential to maintain an optimum health and control obesity.

5. CONCLUSIONS

Waist circumference and waist-to-hip ratio are measures of central adiposity that appear to predict cardiovascular and diabetes risk better than BMI (Srikanthan, Seeman, & Karlamangla 2009). Much research denotes that the waist-to-hip ratio is the superior health risk-categorizing indicator. In completing and explaining the waist hip ratio for clients, personal trainers can provide supplementary

educational information about reducing cardiometabolic health risks and improving quality of life through the practice and training of Zumba fitness and dance fitness program.

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