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Effect of strong by Zumba on waist hip ratio of middle aged sedentary females

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Abstract
The aim of this study was to determine the prevalence of obesity and health risk by measuring waist circumference, hip circumference and waist hip ratio. This study was carried out on 15 sedentary women aged 35-40. Four week Zumba strong fitness program was given to the subjects at a dance and fitness studio of Kolkata under 20°-24 °C. Prior to the study, body weight, height, waist circumference and hip circumference of all the subjects were taken. Based upon these values, waist-hip ratio was calculated before and after the fitness training. Percentage of overweight and obese was 42% respectively prior to the training. Fitness is a good way to fight obesity hence Zumba strong was taught to the subjects. The effects of the Zumba strong were analyzed by using Paired sample 't' test. The obtained result showed that Zumba strong achieved significant improvement in total body weight loss and waist hip ratio ($p<0.05$).

Keywords: Zumba strong, WHR, sedentary, obesity, over weight

Introduction
Increase in body weight and obesity is posing a real threat to health both in children as well as adults all over the world. Obesity has become a serious health problem in the developed as well as developing countries. The prevalence of obesity in women exceeds than that in men. Over weight and obesity are risk factors for cardiovascular diseases, certain types of cancers, type 2 diabetes, hyper tension, osteoarthritis, gall stones, dislipidemia and musculoskeletal problems. Simple anthropometrical measurements are taken to rule out obesity and are more practical both in the clinical practice and for large scale epidemiological studies. Body mass index (BMI) which is calculated as weight in kilograms divided by the square of height in meters is the most widely used and is a simple measure of body size. However this measurement does not account for variation in body fat distribution and abdominal fat mass. Excess intra-abdominal fat is associated with greater risk of obesity related morbidity than in overall adiposity. 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 (Medical Journal of Australia 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. 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. According to WHO, 60 to 85% of people in the world—from both developed and developing countries—lead sedentary lifestyles, making it one of the more serious yet insufficiently addressed public health problems of our time. It is estimated that nearly two-thirds of children are also insufficiently active, with serious implications for their future health. The craze now known as Zumba fitness is said to have started as a mistake by Colombian trainer Alberto "Beto" Perez. One day in the mid-90s, Beto reportedly forgot to bring his regular aerobics-style music tape to the group exercise class he was leading.

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With no music and a class to teach, he raced back to his car and scrounged up a cassette tape of Latin dance music. As the lively beats of Merengue and Rumba rang out, Beto drew upon his experience dancing in Salsa clubs and choreographing for local artists. Soon he was leading his pupils through a fun series of dance steps—and Rumbacize was born. It was an instant hit, and quickly became the most popular class at his gym. In 1999, Beto brought Rumbacize with him when he moved to Miami. It immediately caught on there as well and, with the help of a pair of entrepreneurs, Beto rebranded his class and transformed it into the global franchise that is Zumba fitness today. This modern approach of fitness exercising satisfies goals such as harmony of the body, improving posture and strengthening bone-joint segments of the locomotors apparatus (Furjan-Mandic, Kosalec, & Vlasic, 2011) [4].

Methodology

The study was conducted at Fusion Step fitness studio, Kolkata. In the present study a total of 15 sedentary females were included randomly from the total of 120 candidates who enrolled for the program. Prior medical certificates were attained from the participants who were to take part in the study. Waist and hip circumference and waist-hip ratio were measured by the following procedures:

Waist circumference was measured using a measuring tape over the unclothed abdomen, with measurements made halfway between the lower border of the ribs and the highest point of iliac crest (at the umbilicus level) in the standing position. Participants with waist circumference of 80-87.9 cm were classified as overweight and with >88.0 cm were classified as obese. Hip circumference was measured over light clothing at the widest point over the buttocks when viewed from the side. Waist hip ratio was obtained by dividing the waist circumference by hip circumference. 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 and Dahlia (2007) [15].

Result

Table 1: Significance of Mean Difference of Waist Hip Ratio Due To Effect of Zumba Toning

Groups	Mean	S.D.	Mean Diff.	S.E. mEAN	't' ratio
WHR(pre)	.8234	.05855	.01000	.0044	2.32*
WHR (Post)	.8134	.06277			

*Significant at 0.05 level
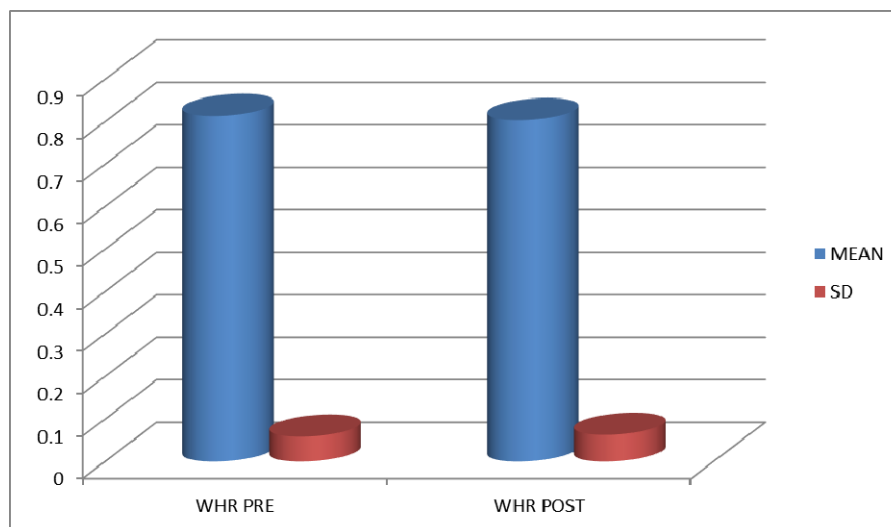*'t' value required to be significant at 0.05 level of confidence with 14 degree of freedom was 2.14

Fig 1: Graphical Representation of Significance of Mean Difference and Standard Deviation of Waist Hip Ratio Due to the Effect of Zumba Toning of Middle Aged Sedentary Females

Discussion

Over weight and obesity are common health conditions. Body mass index, waist circumference are the commonly used parameters to evaluate obesity. The influence of high values of all these parameters on various metabolic and cardiovascular diseases is multiplicative, so weight loss should be urged to all those who are falling in the above said category. The present study was an attempt to identify obese middle aged females by waist circumference and waist-hip ratio. Han, has also reported that the larger waist circumference helps in identification of people at increased cardiovascular risks. The ever-increasing worldwide obesity epidemic poses increased risk for coronary heart disease, hypertension, abnormal cholesterol, diabetes mellitus, sleep apnea and certain cancers. 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 scholar is greatly satisfied to mention that the findings

have accomplished the purpose for which the study was initially conceptualized. The t- test employed to find the significant difference was greater than the tabulated value at 95% level of confidence ($p<0.05$). Initially the mean waist hip ratio of the subjects was 0.8225, which depicts that the average were at the verge of obesity, but after the implication of the dance fitness routine, the mean waist hip ratio came down to 0.8113, which showed that there was a 0.112 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 >35 inches (88 cm) in women and >40 inches (102 cm) in men is associated with higher cardiometabolic risk (Ness-Abramof and Apovian, 2008) [8]. A study done by Welbourne and Dhaliwal (September 2003) [16] showed that obesity assessed by waist hip ratio is a better predictor of cardiovascular diseases and Srikanthan, Seeman, and Karlamangla (2009) [14] confirm, and cite several other investigations that show waist-to-hip ratio being the superior

clinical measurement for predicting all cause and cardiovascular disease mortality. Welborn and Dhaliwal 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. In the INTERHEART study, it was very clear that out of different anthropometric measures waist hip ratio shows the strongest relation with the risk of myocardial infarction. More over this ratio was the strongest predictor of MI irrespective of age, sex, smoking status, diabetes, lipid levels and blood pressure. One more study also confirmed waist hip ratio as an important risk factor for death from coronary heart diseases. Thus waist-hip ratio is the best of all parameters in anthropometry while assessing obesity the importance of central distribution of fat has been known since decades. Waist circumference has become the preferred measure for abdominal obesity.

Conclusion

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, and Karlamangla 2009) [14]. Much research denotes that the waist-to-hip ratio is the superior health risk-categorizing indicator.

The Zumba strong fitness Program was found to be a good fitness routine in reducing the waist hip ratio which inturn helped to reduce health risk among the middle aged sedentary female individuals. Thus to conclude it is emphasized that middle age is a unique intervention point in the life cycle and the knowledge regarding optimal nutrition can be acquired during this period that could prevent or delay ageing related illnesses later on. Further, it is during these years that most people develop life style habits that are likely to become the foundations of their ageing problems. The Zumba strong fitness proved to be a very effective routine in reducing waist hip ratio among middle aged females, significant changes occurred due to the fitness routine ($p<0.05$) with a mean difference of 0.010, which inturn resulted in reducing health risk among the sedentary middle aged female individuals.

References

1. Colditz GA, Willett WC, Rotnitzky A, Manson JE. Weight gain as a risk factor for clinical diabetes mellitus in women. 1995; 122(7):481-6.
2. Colditz GA, Willett WC, Stampfer MJ. Weight as a risk factor for clinical diabetes in women. Am J Epidemiol; 1990; 132: 501-13.
3. Carman WJ, Sowers M, Hawthorne VM, Weissfeld LA. Obesity as a risk factor for osteoarthritis of the hand and wrist: a prospective study. Am J Epidemiol. 1994; 139:119-29.
4. Furjan-Mandić G, Kosalec V, Vlašić J. The effects of aerobic exercise on the increase of repetitive strength in women. In S. Simović (Ed.), 3th International aspects of Sports, Physical education and Recreation. 2011, 75-83.
5. Hu FB, Manson JE, Stampfer MJ. Diet, life style and the risk of type 2 diabetes mellitus in women. N Engl J Med. 2001; 345:790-97
6. Kumanyika SK. Obesity in minority population: an epidemiologic assessment. Obes Res. 1994; 2:166-83.
7. Manson JE, Colditz GA. Stampfer MJ. A prospective study of obesity and risk of coronary heart disease in women. N Engl J Med. 1990; 322:882-89.
8. Ness-Abramof R, Apovian CM. Waist circumference measurement in clinical practice. Nutrition in Clinical Practice. 2008; 23(4):397-404.
9. Oreb, Matković, Vlašić, Kostić. The structure of the functional abilities of the dancers. Croatian sports herald. 2007; 9(1):16-23
10. Ounpuu S, Negassa, Yusuf S. INTERHEART: a global study of risk factors for acute myocardial infarction. Am Heart J. 2001; 141:711-21.
11. Park, Park, Kwon, Yoon, Kim. The effects of long-term aerobic exercise on maximal oxygen consumption, left ventricular function and serum lipids in elderly women. Journal of Physiological Anthropology and applied Human Science, 2003; 22(1):11-17. doi: 10.2114/jpa.22.11; PMid: 12672978
12. Prineas RJ, Folsom AR, Kaye SA. Central adiposity and increased risk of coronary artery disease mortality in older women. Ann Epidemiol. 1993; 3:35-41.
13. Reilly JJ, Dorosty AR. Epidemic of obesity in UK children. Lancet. 1999; 354:1874-75.
14. Srikanthan P, Seeman TE, Karlamangla AS. Waist-hip-ratio as a predictor of all-cause mortality in high-functioning older adults. Annals of Epidemiology, 2009; 19:724-731.
15. Welborn TA, Dhaliwal SS. Preferred clinical measures of central obesity for predicting mortality. European Journal of Clinical Nutrition, 2007; 61:1373-1379
16. Welborn TA, Dhaliwal SS, Bennett SA. Waist-hip ratio is the dominant risk factor predicting cardiovascular death in Australia. Medical Journal of Australia; 2003; 179:580-85.
17. Wilding J, Finer N. Obesity and risk of Myocardial infarction. The INTERHEART Study. 2006; 367(9516):1053
18. Yadav S. Obesity: An increasing problem in the developing countries. Indian J Practical Pediatric; 2001; 4: 293-99.
19. Zhu SK, Wang ZM, Heshka S. Waist circumference and obesity-associated risk factors among whites in the third National Health and Nutrition Survey. Am J Clin Nutr. 2002; 76:743-49.