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THE INFLUENCE OF AQUA AEROBIC TRAINING ON BODY MASS REDUCTION IN MIDDLE AGE WOMEN OF MANIPUR

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Abstract

Regular physical activity has a substantial impact on lowering the risks associated with health. Aquatic training program can improve the physical function in humans and raise the quality of their lives in middle and older age .The study aimed to determine the effect of aqua aerobic training on body composition of middle age women of Manipur. Totally 40 women was randomly selected having an average age 39±2.16 years from Kakching Mayai Leikai, Kakching, Thoubal District, Manipur. They were randomly divided into two groups: Experimental group (those undertaking a aqua aerobic training program) and a control group with 20 participant in each group. The aqua aerobic training was assign to experimental group for 12 weeks series for five days per week while control group was not given any training . The training was given for 45 minutes with 15 minutes of warming up and cooling down .The subjects Body Mass Index (BMI) weight were measured automatically using a BWB-800 AS scale (Tanita), and height with HR-200 Stadiometer (Tanita). BMI was calculated as weight in kilograms divided by height squared (kg/m2) in meters. To estimate the body fat mass (BFM) four sites skinfold measurement were taken with skinfold Callipers. The four sites were triceps, abdominal, suprailiac and thigh, (BFM) body fat mass were measured with the Jackson and Pollock 4 site skinfold formula before and after the completion of aqua aerobic training program .The paired t-test and analysis of covariance (ANCOVA) were used , the data analyzed with the help of SPSS (20 version) software and the level of significance was set at 0.05 level of confidence. Results: After the 12 weeks of aqua aerobic training program, It shows the training group was significantly decrease in weight.

Introduction

Aqua aerobics is a great workout technique for toning our entire body. Exercising while in water while adding natural water resistance to every movement we make will help us tone our body. Hydrodynamic properties of water such as density, buoyancy, and resistance make these exercises less exhausting than land based physical activities, while simultaneously giving similar physiological effects. Physical activity levels are decreasing among middle age group in countries around the world , especially in urban areas. It is estimated that less than one – third of young people are sufficiently active to benefit their present and future health and well-being. As our lifestyle becomes more convenient because of the rapid development and changes in modern society, more and more instances of people getting obese occur. This is due to the increase of calorie intake and lack of exercise caused by westernization, urbanization, and industrialization. With this, obesity is, in fact, a social issue. Importantly, when patterns of physical activity and healthy lifestyles are acquired during childhood, adolescence and middle age they are more likely to be maintain throughout the life span. Consequently, improving physical activity level in middle age people is imperative for the future health. Exercise in the water or aqua aerobic program developed by National Arthritis Foundation YMCA (1980), as a therapeutic medium in health care[1] . In the past two decades, aqua aerobic training or water-based exercise become as a alternative exercise program to achieve fitness and rehabilitation purposes for individuals who physically had difficulty in exercising on land[2,3]. Many

studies proved aquatic training can increase fitness components such as flexibility, muscle balance, muscle strength, cardiovascular endurance, and decreases the body fat percentage of patient, arthritis and disabled population and elder people [4,5,6,7] and it has a significant multiple health outcomes and positive physical and psychological effects [8,9].

Besides, water exercise which also called aquatic exercise program, aqua aerobic , water aerobics, shallow-water or deep – water running or walking exercise, and shallow or deep water ,aqua aerobic training , or similar titles are safer than land-based exercise to reduce risk of injuries and difficulty of exercise [10,11,12]. All these exercises typically are aerobic exercises and performed in shallow water. Meanwhile, the water density is approximately 800 times of air. Training in the water media provides high levels of expending energy with relatively little effort to the body [13], which is essential to expend calories and weight loss. The results of similar study (Barbosa, et al., 2011) in an aquatic training program with 6 weeks, 2 session per week; 40 minutes found significantly promoted body composition (skinfold assessed) and the response of physiological variables in healthy middle-age women even though there was non- significant improvement in their weight and BMI [14].

Study by Kumar & Sundar (2016), in 6 weeks (60 minutes and three sessions a week) aqua aerobic exercises and aerobic exercises proved effect on BMI among college students (17-23 years, BMI; 24.53 $kg.m^{-2}$) Compared to the control group. These results indicated that both aqua aerobic training (-2.59$kg.m^{-2}$) and aerobic training (2.05$kg.m^{-2}$) improve BMI, and it has been suggested that the aquatic training provides an alternative of exercising for overweight , injured or ill individual. Aqua aerobic training can increase energy expenditure while immersing the body in water and weight up to 90% less than on land [15] and it is non-weight bearing nature. Water – based exercise is adequately common form of physical activity among the elderly population [16], obese people well-satisfied and motivated with a chest –deep water because they can hide their bodies from the view of others during the exercising [17]. However, it is unclear how to effect the aqua aerobic training on change of health risk factors particularly weight loss, BMI, and BFP of middle age women .Therefore, this study aimed to investigate the effect of 12 weeks aqua aerobic training on body composition of middle age women of Manipur.

2. Statement of the problem

The purpose of the study is to find out the effect of aqua aerobic training on body mass reduction in middle age women of Manipur.

3. Objective

To determine the effect of aqua aerobic training on body composition of middle age women of Manipur.

4. Hypothesis of the study

1 H1- The aqua aerobic training would be more significant difference to the experimental group on body mass index of middle age women of Manipur .

2 H2- The aqua aerobic training would be more significant difference to the experimental group on body fat mass of middle age women of Manipur.

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5. Methodology

5.1 Selection Of Subjects

For the study 40 women of average age 39± 2.16 years who volunteer to participate in the study were included randomly from Kakching Mayai Leikai, Kakching, Thoubal District, Manipur. The subject was then divided into two groups i.e. control group and experimental group. The subjects were determined about the purpose and protocols of the training and their signed on consent was taken from them before the beginning of training.

5.2 Experimental Design

It was experimental pre test and post test control group design.The experimental group participates in aqua aerobic training while control group did not participate in any training program rather they involved in their daily routine program. Both groups measurement was taken twice as before and after the 12 weeks aqua aerobic training to determine the effect of aqua aerobic training on selected body composition variables i.e. Body mass index (BMI) and body fat mass (BFM) among middle age women of Manipur.

5.3 Training Program

The aqua aerobic training were planned by the researcher under the guide of swimming expert of LNIPE, Gwalior, M.P. The aqua aerobic training was assign to experimental group for weeks series for about 45 mins each day for five days a week. A special appeal was made to the middle age women participants so that they will not miss any of their classes. Each training session begins with a 10 minutes warm up, 5 minutes cooling down and the rest for main activity. Background aerobic music was played to motivate the participants and build interest on training, to achieve the target the training intensity was gradually increased after every 4 weeks. The sequence of aqua aerobic training program is described in table 1

5.4. Experimental Procedure

Measurement was made on early morning before breakfast, as the subject wear simple clothes, their individual BMI, weights were measured automatically using a BWB-800 AS scale (Tanita), and height with HR-200 Stadiometer (Tanita). To estimate the body fat mass (BFM) four sites skinfold measurements were taken with skinfold Callipers. The four sites were triceps, abdominal, suprailiac and thigh, (BFM) Body fat Mass were measured with the Jackson and Pollock 4 site skinfold formula.

6 . Statistical Analysis

The data collected before and after the 12 weeks regular aqua aerobic session were given statistical treatment using IBM SPSS version 20. The data were analyzed by predicting mean change between the initial scores and standard deviation the scores after the aqua – aerobic training program were compared for body mass index (BMI)and (BFM) body fat Mass and applying a paired sample ‘t’ test and analysis of co-variance (ANCOVA). The data analyzed with the help of SPSS (20 Version) Software and the level of significance was set at 0.05.

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Table 1: Aqua Aerobic Training Program

Aqua Aerobic Exercises/Training content	No. of circuit
1.The main training (30 mins) Aqua jogging Flutter kicking Leg lifts. Standing water push up. Alternating scissor jump. Kick your Tuck jump. Chest fly. Splash the water. Cross punches with hip rotation. Front kick, back kick and jogging. Alternate front kick back kick and rotate whole body. Butterfly beat(clap) Punches Jumping jacks in the pool.	4 (1-4 weeks) 5 (5-8 weeks) 6 (9-12 weeks)

Table – 2 Comparison of mean between pre and post test of experimental group of body mass index and body fat Mass.

Variables	N	Mean ±SD		SE		t	P
Body Mass Index	20	Pre Test	Post Test	Pre Test	Post Test	5.03	.000
		26.58±3.46	24.20±2.55	0.77	0.57		
Body Fat Mass		14.94±3.58	12.28±3.51	.80	0.78	3.87	.001

Data presented as M±SD= Mean±Standard Deviation, N= no.of subject, SE= Standard Error, P= Probability.
*Significant at 0.05

Table 3

Comparison of mean between pre and post test of control group of body mass index and body fat mass.

Variables	N	Mean ±SD		SE		t	P
Body Mass Index	20	Pre Test	Post Test	Pre Test	Post Test	.70	.48
		26.72±2.79	26.43±2.37	0.62	0.53		
Body Fat Mass		15.4±2.47	16.23±3.68	.55	.82	-1.66	.113

Data presented as M±SD= Mean±Standard Deviation, N= no. of subject, SE= Standard Error, P= Probability.
*Insignificant at 0.05

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Table 4.

Pre and Post Means Comparison of Body Mass Index (BMI) and Body Fat Mass (BFM) between Experimental and Control Groups (ANCOVA)

Variable	Source	Type III Sum of squares	df	Mean Square	F	P
Body Mass Index	Group	45.944	1	45.944	18.89	.000
	Error	89.99	37	2.432		
	Total	25925.62	40			
Body Fat Mass	Group	124.68	1	124.68	18.28	.000
	Error	252.311	37	6.819		
	Total	8779.17	40			

*Significant difference at 0.05 level of confidence, where tabulated F(0.05) (1,37) = 4.08

6.1. Results

In Table 2 shows the changes in weight, body mass index and body fat mass of experimental group. The body mass index was significant with mean ± standard deviation (M±SD) for pre test and post test was 26.58± 3.46 and 24.20± 2.55 respectively with P<0.05 showing body mass index, weight decreases significantly upon 12 weeks aqua aerobic training. Highly changes in body fat mass were observed as the (M±SD) for pre test and post test was 14.94±3.58 and 12.28± 3.51 and t= 3.87 respectively with P<0.000 showed a significant difference at 0.05 confidence level.

In Table 3 shows the changes in body mass index and body fat mass of control group. The body mass index, weight and body fat mass was not significant with mean ±standard deviation (M±SD) for Pre test was 26.72± 2.79 Post test was 26.43± 2.37 and 15.4±2.47 and 16.23±3.68 respectively with P>0.05 .

In Table 4 shows that there were significant difference among the pre and post test means of Body Mass Index and Body Fat Mass between experimental and control groups as the obtained critical 'F' = 18.890 for BMI and 18.28 were greater than the tabulated 'F' = 4.08 at 0.05 level of confidence.

7. Discussion

Regular physical activity leads to significant changes in terms of increased health related fitness, and can reduce risk factors for developing a range of disabling medical conditions which occur in inactive people[18]. In general training is beneficial for health & physical fitness, while a sedentary lifestyle has a negative effect on a person's well being. The main purpose of this study is to investigate the effect of 12 weeks aqua aerobic training program in terms of the effect on weight loss, body mass index and body fat mass in body composition of middle age women of Manipur the meaning reflected in the relationship between the variables & the results is discussed as follows:

The training program resulted in weight loss, a decrease in the subjects BMI and a decrease in their total body fat mass when compared the control group. Circumstances measurements also showed that those of the aqua aerobic training group were more significant than for the control group ($P<0.05$).
These results were similar to those found in the studies by McCord etal and Carol etal [19] reduction in body weight and fat composition after an eight 12 week step aerobic exercise and dance program . Another study by Stosic et al.[20] reveals that dance aerobic can be an effective form of reducing body fat and increasing lean body mass. Physical changes on body progress upon training. Correct training protocol was a basis for making training goal oriented. Our body burns out the excess fat in terms of calories during exercise, more intense the exercise more calories it burns[21]. A number of studies have mentioned that body weight and body composition changes as a result of aquatic training [22,23,24]. Other dance studies have reported a decrease in the body fat mass and BMI of sedentary obese women who danced two to three times per week for 12 weeks [25].
According to the data, a significant difference was found between the pre and post-test values for body weight , BMI , triceps , abdominal , suprailiac and thigh in the experimental group($P<0.05$). In addition, there were no significant differences between the means of the pre and post-test body weight ,BMI, and BPF, triceps, abdominal suprailiac and thigh of the control group($P>0.05$).

It was expected that there would be a significant difference in the body weight, body composition parameters and body fat mass by the end of the 12 week aqua aerobic training program in the experimental group. A number of studies have mentioned that body weight and body composition changes as a result of aqua aerobic training .

The main motive of training program was achieved. The body mass index and body fat mass show significant changes. The most important finding of the present study was that there was a clear response to the effect of the 12 week aqua aerobic training program on middle aged women. In addition there was an important development in body composition values, BMI, the amount of weight change and body fat mass rate of middle-aged women of Manipur. These positive changes in body composition were more pronounced following the implementation of the aqua aerobic training with middle-aged women in this study. This research demonstrated that aqua aerobic training program is a useful training modality for weight loss and body composition in Manipur women .

8 . Conclusions

Physical training in water is a possibility to try to increase physical and mental health of women without the risk of injuries. In a 12 week aqua aerobic training in middle-aged women without caloric restrictions was associated with reduction in weight, body fat mass and with improvement of aerobic fitness and quality of life (these findings suggest the usefulness of conducting a randomized controlled trial with long-term outcome assessments).The indication that aqua aerobic training results

in physical and mental health benefits for women suggests that it might be a valuable therapy in itself and helps to improve weight loss for young women to decrease or stop the health risk factors in older age .

REFERENCES

1. Brody, L.T.and P.R.Geigle, Aquatic exercise for rehabilitation and training. 2009: Human Kinetics.
2. Delevatti, R.,E Marson, and L.F.Kruel. Effect of aquatic exercise training on lipids profile and glycaemia:a systematic review. Revista Andaluza de Medicina del Deporte.2015;8(4): 163-170.
3. Meredith-Jones,K., et al. Upright water-based exercise to improve cardiovascular and metabolic health: a qualitative review. Complementary therapies in medicine. 2011.19(2): 93-103.
4. De Mattos, F., et al, Effects of aquatic exercise on muscle strength and functional performance of individuals with osteoarthritis: a systematic review. Revista Brasileira de Reumatologia(English Edition). 2016;56(6): 530-542.
5. Kantyka, J.,et al, Effects of aqua aerobics on body composition, body mass , lipid profile, and blood count in middle-aged sedentary women. Human Movemrnt.2015; 16(1): 9-14.
6. Kim, S.B.and D.M.O' sullivan. Effects of aqua aerobic therapy exercise for older adults on muscular strength, agility and balance to prevent falling during gait. Journal of physical therapy science. 2013;25(8):923-927.
7. Kim, Y.The effects and theory of aqua aerobic exercise on health promotion. J Rhumatol H.1998;5:296-302.