

# Aqua Zumba® Versus Aqua Jog as The Treatment of Obesity among Collegiate Students

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**Abstract.** Introduction: In a world where obesity is on the rise, water sports have become a safer and more suitable alternative to exercise for obese people, who are at higher risk of many diseases and more likely to die. the purpose: The aim of this study was to compare the effects of Aqua Zumba® Fitness and Aqua Jogging on selected health parameters in obese students. Method: Sixty obese female students with a sedentary lifestyle were enrolled in Aqua Zumba® fitness (N=20, age 26.75 ± 5.34 years, height 160.88 ± 4.40 cm, weight 83.67 ± 8.40 kg), aqua jogging (N=20, age 27.30 ± 8.40 kg). 5.01 years) or height 159.86 ± 5.40 cm, weight 82.83 ± 7.40 kg) and controls (N = 20, age 26.80 ± 5, 23 years, height 157.74 ± 5.83 cm, weight 81.37 ± 8.47 kg). The exercise group received an aquatic exercise program at an intensity of 50-75% of maximum heart rate three times a week for 60 minutes per session for 12 weeks. Fat mass, muscle mass, waist circumference, blood glucose levels, and blood pressure (BP) were measured at baseline (week 0) and after exercise intervention (week 13). result: Both aqua groups showed significant changes (p<0.05) in most parameters except fat mass and diastolic blood pressure. Aqua Zumba® produced significantly better changes in reducing AC stress compared to aqua jogging. Conclusion: A moderate-intensity aqua jogging or aqua Zumba® session is an alternative exercise program for overweight college students looking to combat the trend toward obesity.

**Keywords:** Aqua Zumba, aqua jog, health parameters, obese females.

## 1 Introduction

According to a recent report, Malaysia has the highest rate of obesity and overweight among Asian countries, especially among women at 54.7% [1]. A number of studies [1-2] show that obese people have a shorter life expectancy, higher lifetime health care costs, and a higher risk

of non-communicable diseases than those of normal weight. The main factors contributing to overweight and obesity are decreased physical activity (PA), increased sedentary behavior and unhealthy eating habits as a result of rapid urbanization [3]. These factors cause energy intake to exceed energy expenditure and cause the obesity phenomenon. Maintaining a caloric deficit by increasing physical activity is one way to combat the health problems associated with obesity [4-6]. According to WHO guidelines (2020), adults aged 18-64 should do at least 150 minutes of moderate-intensity aerobic PA per week. The ACSM (ACSM) and American Heart Association (AHA) clearly show that prolonged low- and moderate-intensity aerobic exercise promotes fat loss and ideal weight. However, weight-bearing exercise (exercise in which a force acts against gravity), such as resistance exercise or aerobic exercise, may not be suitable for overweight people, and overuse injuries can lead to cessation of exercise. [7]. Experts advise obese people to engage in physical activity and exercise without putting on weight. With this in mind, water sports have been shown to be safer and more effective for overweight people compared to land-based exercise. The high density, hydrostatic pressure, elasticity and low temperature of water increases energy expenditure, improves muscle activation, improves venous return to the heart and maximizes range of motion (ROM) while simultaneously, joint stress and pain are reduced. It minimizes strain on joints and muscles, reducing the risk of injury [8-9]. Among the various forms of aquatic exercise, aquajogging has been the most extensively studied in publications to date. A new water exercise program that has recently gained popularity is Aqua Zumba® Fitness, introduced by Zumba® LLC.

## **2 Methods**

### **2.1 Participants**

A total of sixty (N=60) female university volunteers between the ages of 20 and 39 participated in this study. All were randomly selected with the following inclusion criteria: 1) obesity, defined as BMI (30-40 kg/m<sup>2</sup>) and body fat percentage (35-45%); 2) sedentary, defined as not participating in any structured physical activity in the past six months; and 3) be in good health, defined as being free of disease or physical disability. Participants with heart disease, hypertension, hypotension, diabetes mellitus, endocrine disorders, menstrual irregularities, musculoskeletal injuries, or those treated with any medication or consuming any supplements of any kind are excluded. The physical characteristics of the participants are shown in Table 1. Participants were asked to complete an informed consent form before they participated. This study was approved by the review board of the University of Teknologi MARA, 600RMI (5/1/6).

### **2.2 Aqua exercise regimens**

Participants were randomly assigned to aqua Zumba (n=20), water jogging (n=20), and control (n=20) for 12 weeks. Aqua Zumba® Fitness Group participants perform his four core rhythms (salsa, cumbia, reggaeton only) of the Aqua Zumba Fitness Program, which includes various combinations of full-body exercises, 3 days a week for 60 minutes per session (10 warm minutes) Did. - up, 45 minute conditioning, 5 minute cool down) led by a qualified Aqua Zumba Instructor. Training frequency gradually increased from 60-80 bpm (first 4 weeks), 70-100 bpm (weeks 5-8) and 90-110 bpm (last 4 weeks). Participants were assigned a target heart rate of 50-75% of their age-predicted maximum heart rate. Participants in the water jogging group were

asked to perform flat jogging (both feet in contact with the bottom of the tank) with similar frequency and duration of exercise, 3 days per week for 60 minutes per session. (10 min warm-up, 45 min conditioning, 5 min cool-down) maintained the same heart rate as the other intervention groups.

### 2.3 Outcome measures

Before other assessments, height was measured using an anthropometric apparatus (SECA, Germany) with an accuracy of 0.1 cm. Body weight, body mass index (BMI), FM, and LM were measured using a bioelectrical impedance analyzer (BIA), InBody 720 (Biospace, Korea). The alternating current was measured horizontally to within 0.1 cm at the narrowest point of the gap between the nose and navel of the sword. The participant's resting systolic and diastolic blood pressure was measured in mmHg using a digital sphygmomanometer (OMRON, HEM-7130) while the participant was seated comfortably in a chair with a backrest and ring, it was done. The bit is placed firmly on the competitor's left arm. Place your arms on the table, parallel to your heart. Measurements were taken after participants rested in a sitting position for 10 minutes. Blood sugar levels are measured using a fasting blood sample.

## 3 Results

Table 1 shows the physical characteristics of the participants between the groups. Initially, we confirmed that the three groups had similar physical characteristics with Levene's test for homogeneity of variance with  $p > 0.05$ . In addition, one-way ANOVA between groups

The analysis showed that there was no statistically significant difference in the mean scores of all variables between the three groups with  $p > 0.05$ . Therefore, we can conclude that all groups are equally distributed.

Table 1 Baseline physical characteristics of participants by group.

Variables	Aqua Zumba	Aqua jog	Control	P-value
Age (years)	26.75±5.34	27.30±5.01	26.80±5.23	0.14*
Height (cm)	160.88±4.40	159.86±5.40	157.75±5.83	0.08*
Weight (kg)	83.67±8.40	82.83±7.40	81.37±8.47	0.17*
BMI (kg/m <sup>2</sup> )	32.58±4.10	32.67±4.82	33.19±4.52	0.47*
BF% (%)	45.29±5.21	46.22±5.81	46.21±4.87	0.38*

\* $p > 0.05$  in Levene's test for homogeneity

In Table 2, significant changes were observed within and between groups for lean mass, abdominal circumference, glucose, and resting systolic blood pressure across 12-weeks interventions with partial eta squared ranged from .72 to .451 (moderate to high effect size). Both aqua interventions produced significant improvement compared to the control group on most of the parameters. However, Tukey Post Hoc indicated Aqua Zumba® demonstrated significant greater changes compared to aqua jog ( $p < .05$ ) on abdominal circumference (AZ = -12.8%, AJ = -4.45%) parameter. Hence, it can be concluded that the Aqua Zumba® Fitness

program elicited better changes in improving health aspect compared to aqua jog exercise in obese collegiate females.

Table 2 Changes on health parameters across groups following 12-weeks intervention.

Variables/pre-post scores	Aqua Zumba group	Aqua jog group	Control group	Time effect, P-value	Group effect, P-value
<b>Fat mass (kg)</b>					
Pre	39.20 ± 8.28	39.26 ± 6.99	39.60 ± 4.57	0.00	0.12
Post	32.77 ± 6.28 <sup>c</sup>	34.61 ± 6.23 <sup>c</sup>	40.39 ± 4.95 <sup>ab</sup>		
<b>Lean mass (kg)</b>					
Pre	24.68 ± 2.60	26.04 ± 3.20	23.58 ± 1.63	0.02	0.00
Post	25.89 ± 2.57 <sup>bc</sup>	26.60 ± 3.22 <sup>ac</sup>	22.57 ± 2.12 <sup>ab</sup>		
<b>Abdominal circumference (cm)</b>					
Pre	104.42 ± 6.59	105.74 ± 9.1	105.15 ± 7.6	0.00	0.03
Post	90.96 ± 7.58 <sup>bc</sup>	101.03 ± 7.9 <sup>ac</sup>	107.42 ± 8.0 <sup>ab</sup>		
<b>Glucose (mmol/L)</b>					
Pre	5.93 ± 4.0	5.84 ± 0.36	5.91 ± 0.41	0.00	0.00
Post	4.81 ± 1.7 <sup>bc</sup>	4.89 ± 3.1 <sup>ac</sup>	5.94 ± 0.44 <sup>ab</sup>		
<b>Systolic blood pressure (mm Hg)</b>					
Pre	126.70 ± 2.11	127.55 ± 6.13	126.45 ± 1.64	0.00	0.00
Post	115.30 ± 5.45 <sup>bc</sup>	118.35 ± 4.48 <sup>ac</sup>	128.15 ± 5.81 <sup>ab</sup>		
<b>Diastolic blood pressure (mm Hg)</b>					
Pre	86.95 ± 9.10	86.60 ± 7.39	86.45 ± 4.07	0.00	0.06
Post	78.35 ± 7.01 <sup>c</sup>	80.70 ± 6.19 <sup>c</sup>	88.45 ± 5.55 <sup>ab</sup>		

a = sig. different to aqua zumba

b = sig. different to aqua jog

c = sig. different to control

## 4 Discussion

The main finding of this study was that after 12 weeks of Aqua Zumba® fitness and aqua jogging, all variables except fat mass and resting blood pressure showed significant positive changes. Interestingly, any form of upright exercise in shallow water has a positive effect on eliminating obesity-related health problems in overweight schoolgirls.

Overall, both aqua programs were equally effective in improving muscle mass, reducing waist circumference, blood glucose levels, resting systolic blood pressure, and improving overall fitness. Although the improvement in fat mass did not reach statistically significant levels, it is interesting that both aqua groups showed a reduction in body fat mass after the intervention (Aqua Zumba® = -6.43 kg, Aqua jog = -4.65 kg). It was not observed in the control group (+0.79kg). Similar to previous studies [10–12], this study also showed that consistent aquatic exercise positively affected body composition in different populations. By activating the

oxidative energy system, the continuous rhythmic movement of large muscle groups during aerobic exercise promotes the burning of fat (mainly subcutaneous fat) as the primary source of energy [13]. Loss of fat mass alters body shape, especially with a gradual decrease in hip and waist circumference [14]. However, the Aqua Zumba® program in this study led to a significant reduction in waist circumference. The fact that Zumba® includes salsa and reggaeton dance routines that target core muscles may be the mechanism behind this discovery following the Aqua Zumba® program [15]. Your arms, ribcage, abs, hips, glutes, quads, hamstrings, and gastrocnemius muscles all need to work in a salsa or reggaeton routine [15]. The current study corroborates previous studies that also found significant changes in waist circumference after the Zumba® program [16].

The above results indicate that both water exercise groups showed significant improvements in blood glucose levels. This finding is supported by previous studies by several researchers [11, 20-21]. Reduced insulin resistance to muscle-mediated glucose uptake during and after exercise may be associated with lower fasting blood glucose [21]. Regular aerobic exercise increases the number of insulin receptors in muscle, which also increases insulin binding to monocyte sites. This allows your muscles to use glucose efficiently, especially during exercise, resulting in lower glucose levels [22].

## **5 Conclusion**

This study shows that a 12 weeks regime of Aqua Zumba® Fitness and aqua jog programs effectively improved health parameters in obese collegiate females. Additionally, Aqua Zumba® can induce a greater reduction in abdominal fat, making it a potential exercise method for combating obesity. However, it is suggested that longer aqua exercise intervention durations that can result in significant fat loss in this population be investigated in subsequent studies.

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