

Research Article

Is Zumba® Fitness Effective to Manage Overweight without Dietary Intervention?

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Abstract

Background: Zumba® Fitness is a popular aerobic exercise and sometimes due to its high-intensity is considered sufficient for weight management, from both trainers and trainees, regardless of the type of diet followed. Its effectiveness in weight and body fat loss, with or without dietary intervention has been slightly studied.

Subjects and Methods: In the current randomized controlled trial, thirty two healthy adult overweight women who attended exclusively Zumba® fitness for three times per week, were randomly divided into 3 subgroups and received parallel dietary advice for two months: Group A did not receive dietary intervention (control group), Group B received general healthy eating guidelines based on the Mediterranean pyramid and the food plate model and Group C individualized diet plan according anthropometric characteristics, lifestyle, and dietary habits. A Food Frequency Questionnaire used at baseline to assess dietary habits before the study, and three 24-hour recalls evaluated compliance upon dietary intervention.

Results: Significant reductions in body weight, fat, hip and waist circumference revealed in Group C, and in body fat of Group B.

Conclusions: Zumba® fitness is enjoyable and could be used to enhance weight loss with appropriate dietary individualized advice in overweight subjects. In parallel, it could be effective when combined with healthy eating guidance for improving fat loss and general well being.

Keywords: Zumba® Fitness,; body composition,; diet,; overweight,; diet education

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1. Introduction

Obesity and overweight are among the most critical health problems nowadays. Lifestyle and dietary modifications are crucial tools on weight loss and fat reduction. Proper lifestyle and eating patterns changes should be based on individuals' needs and beliefs, as they require high rates of compliance in order to be followed.

Physical activity influences health and body composition in different ways according to the type, duration, frequency and effort of muscles given when exercising (Westerterp and Kester, 2003) [1]. Aerobic exercise contributes into greater reductions of fat comparing to anaerobic training, but does not augment muscle mass (Redman et al., 2011) [2]. Weight loss is not enhanced with low intensity exercise, whereas exercise with resistance lowers body fat, while sustaining the Free Fat Mass (FFM) (Ross et al., 2000) [3]. High intensity exercise improves body weight, Body Mass Index (BMI), body fat, waist circumference [4] (Irving et al., 2011), and cardiovascular and metabolic functions [5] (Redman et al., 2007) (Wisløff et al., 2005) [6]. The rate of reduction of the abdominal adipose tissue increases, when appropriate dietary changes are combined with exercise, even if these do not aim to weight loss (Giannopoulou et al., 2005) [7]. Generally, it is shown that diet or diet and exercise programs produce a three-to-five-fold greater change in body composition than the exercise programs alone. Weight loss through exercise is only 2-3kg whereas through diet or diet and exercise 10-12kg or 9kg respectively after 4months intervention programs (Miller et al., 1997). Combining diet with exercise results a 20% greater sustained weight loss after 1year intervention than diet alone (Curioni and Lourenço, 2005).

Zumba® fitness is a modern popular type of aerobic exercise, that combines mainly Latin moves with traditional aerobic exercise. Little data exist so far related to its effectiveness on weight loss management and the current investigation aims to determine the rate that Zumba® fitness enhances the rate of body weight and fat loss alone or with the combination of appropriate dietary advice.

2. Methodology

2.1. Participants

Thirty-two healthy women exercising exclusively with Zumba® fitness, three times weekly in local gyms, were recruited in the study and followed up for two consecutive months (8 weeks). Women suffering from chronic disease, on regular medication, pregnant or in menopause were excluded. Participants were randomly divided into three groups according to the dietary intervention they received: Group A (control group) did not receive dietary advice. Group B followed two consecutive- 1hour each-seminars providing behavioral changes regarding healthy eating, based on the food plate model and the Mediterranean pyramid, whereas Group C received a personalized diet plan based on individuals' energy requirements (Henry, 2005) [8] and dietary habits. Dietary guidance, to Groups B and C, was provided by a qualified dietitian. All

participants signed an informed consent before inclusion to the study and the study was approved by the Cypriot Bioethics Committee.

2.2. Anthropometric Measurements

Anthropometric Measurements were performed according to standard procedures (Bi et al., 2016) [9]. Height was measured using a Seca stadiometer at point 0. Weight, percentage (%) of body fat and free fat mass (FFM) were determined at baseline (point 0) and upon completion of the study (point 2) with BIA Tanita Body Composition Analyzer TBF-410MA (Tanita Corp., Tokyo, Japan). All participants were asked to avoid intensive exercise 24 hours before the anthropometric measurements.

2.3. Dietary Intake

A validated self administered food frequency questionnaire (FFQ) was completed by all participants at point 0, to assess their dietary habits for the last six months (Garcia-Larsen et al., 2011) [10]. Three 24-recalls assessed compliance to dietary guidelines during the study (point 0, one month after initiation (point 1) and point 2). Exact meal-time, type, composition, cooking method, rate of satisfaction and place the meal was consumed, were recorded on 24-hour recalls and analyzed with Diet Plan 6.0 (Forest-field Software, 2011).

2.4. Physical Activity Assessment

Participants recorded their heart rates for one minute with the wrist method, before and after each Zumba® fitness session to evaluate the level of physical effort when exercising (Firstbeat Technologies, 2007).

2.5. Statistical Analysis

Statistical analysis was performed with SPSS, version 15.0 (IBM, Chicago, IL, USA). The 24-hour recalls and the FFQs were analyzed with Pearson Chi-square to check the independence between the row and the column, Likelihood Ratio for checking the asymptomatic chi-square distribution of the likelihood ratio of the null hypothesis and Linear-by-Linear association to test the linear trend of the data (Agresti, 1996). The anthropometric changes were first checked for normality with the Kolmogorov-Smirnov test with the use of normality plots and then the paired t-test was performed

to compare the two sets of data. The Wilcoxon test was performed for the nonparametric data. P values ≤ 0.05 were considered statistically significant.

3. Results

Forty-five females were initially informed about the study, whereas thirty-two completed an informed consent and randomly divided into the three groups and completed the intervention (Table 1).

The level of effort while exercising did not differ significantly among participants of the three groups, as shown by the heart rates (mean value before Zumba® sessions 65.8hr/minute and after 119.52hr/minute). Food choices of participants at point 0, as denoted by FFQ analysis, were used to decide proper dietary guidance for Groups B and C.

For Group A, no significant changes were found on macronutrient and micronutrient intake, when comparing the two 24-hour recalls, showing that their eating habits did not change upon intervention.

For Group B, energy and sodium intake appeared lower at both stages of re-evaluation (point 1 and 2) in comparison to baseline (point 0).

For Group C, remarkable changes of energy (increased), vitamin C (increased) and protein (decreased) intake from point 0 to points 1 and 2 were noticed, in order to meet their nutritional needs, as these were determined by the dietitian.

Concerning the anthropometric measurements, in women who performed only Zumba® fitness there was a tendency for weight and fat loss, and also reduction of waist and hip circumferences, but none appear significant. In both Groups B and C, body fat was significantly reduced in comparison to Group A. Additionally, in Group C body weight, hip and waist circumference were reduced significantly (Table 2).

4. Discussion

The current two month randomized control intervention study is one of the few studies carried out on the effectiveness of Zumba® fitness on weight and body fat loss, with or without appropriate dietary changes. Subjects who combined Zumba® fitness together with individualized dietary intervention benefit significantly in regards on body weight, fat and waist circumference reduction, in relation to others receiving no dietary advice or general healthy eating guidelines.

Generally aerobic exercise alone seems effective in maintaining a healthy body weight [11] (Donnelly et al., 2003), whereas in some cases is reported able to reduce

	Age (years)	Height (meters)	Weight (kg)	BMI	Body Fat (%)	Waist circumference (cm)	Hip circumference (cm)	Waist / hip ratio
Group A (n = 10)	21.00	1.61	65.00	25.08	26.00	73.00	99.00	0.74
	30.00	1.65	67.00	24.61	28.00	76.00	100.00	0.76
	22.00	1.67	68.00	24.38	26.00	76.00	103.00	0.74
	38.00	1.61	69.00	26.62	26.00	77.00	104.00	0.74
	23.00	1.62	68.00	25.91	27.00	79.00	105.00	0.75
	26.00	1.65	72.00	26.45	32.20	78.00	103.00	0.76
	27.00	1.64	69.00	25.65	28.90	77.00	104.00	0.74
	29.00	1.68	68.00	24.09	26.90	79.00	106.00	0.75
	32.00	1.60	67.00	26.17	28.30	78.00	100.00	0.78
	30.00	1.56	75.00	30.82	32.30	88.00	110.00	0.80
Mean (±SD)	27.80 (±4.89)	1.63 (±0.03)	68.80 (±2.68)	25.98 (±1.82)	28.16 (±2.26)	78.10 (±3.70)	103.40 (±3.10)	0.76 (±0.02)
Group B (n = 11)	37.00	1.67	69.80	25.03	31.00	84.00	112.00	0.75
	24.00	1.58	70.20	28.12	30.00	88.00	110.00	0.80
	22.00	1.64	62.00	23.05	25.00	71.00	98.00	0.72
	28.00	1.64	67.00	24.91	25.80	71.00	98.00	0.72
	32.00	1.67	70.00	25.10	26.40	79.00	99.00	0.80
	28.00	1.59	65.00	25.71	27.80	69.00	93.00	0.74
	22.00	1.66	72.00	26.13	29.00	82.00	99.00	0.83
	26.00	1.68	70.00	24.80	26.80	80.00	96.00	0.83
	27.00	1.65	68.00	24.98	27.50	78.00	105.00	0.74
	28.00	1.65	69.00	25.34	28.00	80.00	104.00	0.77
	37.00	1.68	69.20	24.52	27.40	82.00	101.00	0.81
MEAN (±SD)	28.27 (±4.96)	1.65 (±0.03)	68.38 (±2.98)	25.24 (±1.17)	27.70 (±1.69)	78.55 (±5.66)	101.36 (±5.56)	0.77 (±0.04)
Group C (n = 11)	29.00	1.63	68.40	25.74	30.20	74.00	107.00	0.69
	34.00	1.54	62.00	26.14	29.80	72.00	105.00	0.69
	28.00	1.56	63.50	26.09	28.20	88.00	108.00	0.81
	23.00	1.67	72.00	25.82	28.60	87.00	108.00	0.81
	26.00	1.63	66.80	25.14	27.40	72.00	97.00	0.74
	21.00	1.67	70.70	25.35	27.00	85.00	100.00	0.85
	28.00	1.69	74.80	26.19	28.00	86.00	102.00	0.84
	23.00	1.72	75.50	25.52	26.50	88.00	100.00	0.88
	36.00	1.59	63.00	24.92	26.40	78.00	90.00	0.87
	22.00	1.60	76.00	29.69	30.00	75.00	100.00	0.75
	27.00	1.60	69.00	26.50	28.50	80.00	101.00	0.79
Mean (±SD)	27.00 (±5.06)	1.63 (±0.06)	69.25 (±5.34)	26.10 (±1.34)	28.24 (±1.42)	80.45 (±6.90)	101.64 (±5.35)	0.79 (±0.07)

TABLE 1: Baseline individuals' anthropometric measurements.

	Group A (p value)	Group B (p value)	Group C (p value)
Weight	-1.841 (0.066)	-1.483 (0.138)	-2.023 (0.043)
Body fat	-0.542 (0.588)	-2.023 (0.043)	-2.032 (0.042)
Waist circumference	-1.841 (0.066)	0.000 (1.000)	-2.121 (0.034)
Hip circumference	-0.921 (0.357)	-1.841 (0.066)	-1.841 (0.066)
Waist / hip ratio	-1.625 (0.104)	-0.535 (0.593)	-1.511 (0.131)

TABLE 2: Relative changes of participants' body composition measurements at end (point 2) and baseline point (point 0). P values lower than 0.05 are considered significant.

weight and fat (Heydari et al., 2012) [12]. It is known that healthy diet works synergistically with working out for achieving weight and fat loss (Leverse et al., 2013) [13], especially when diet is personalized (Centers for Disease Control and Prevention, 2011) [14], is high in protein and restricts calories [5] (Redman, 2007) (Layman et al., 2005) [15].

Zumba® fitness is a new very popular way of aerobic exercise, especially among young women. Zumba® fitness specifically provides magnitude enhancements in health related quality of life factors, cardiovascular and inflammatory functions and as shown elsewhere helps on body fat reduction in overweight, physically inactive women (Domene et al., 2016) [16], improves significantly aerobic fitness, neuromuscular functioning and well-being in female students (Donath et al., 2014) [17] and provokes slow (Vendramin et al., 2016) [18] weight loss, BMI, fat and circumference changes in overweight healthy women (Cugusi et al., 2016) [19] and overweight or obese diabetic [20] (Krishnan et al., 2015), even without dietary intervention when performed consistently for long periods (over 3 months). All these findings are in line to ours, that show in women performing only Zumba® fitness there is a beneficial tendency for reduction of overweight, although not statistically significant.

Our study shows a positive estimation on the effectiveness of Zumba® fitness on weight and fat loss when combined with proper dietary advice. These results could have been enhanced if the study lasted longer, probably for a period of 6 months or even longer, and a follow up period of the participants after one year of the intervention could estimate the long period effect on maintaining the weight loss when Zumba® fitness is performed. Additionally, we have selected overweight young women, to avoid sub-complications of obesity, but the effect in obese individuals is interesting to investigate.

5. Conclusion

Dieting can be harsh opposite to dancing that is enjoyable. Proper dietary advice though and intervention, that takes into consideration one's eating habits, food preferences and lifestyle should be promoted in weight management, and used in combination with modes of exercise that promote the general well being, like Zumba® fitness. Since Zumba® fitness is very popular especially among women, children and adolescents, it could be also used as a prevention measure for obesity together with general dietary education, even in large scale interventional local or national programs, since as we show herein they both tend to lower, slower though, the weight. When overweight and obesity are diagnosed then appropriate personalized diet together with physical activity, like Zumba® fitness, should be applied, and the desirable weight and fat loss will be achieved in shorter periods of intervention.

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