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THE IMPACT OF EXERCISE INTENSITY ON MOOD STATE OF PARTICIPANTS IN DANCE AEROBICS PROGRAMS

Key words: aerobic dance programs, high and moderate intensity, profile of mood state.

ABSTRACT

The aim of the present study was to examine the effect of a single session dance aerobic program of high and moderate intensity on the psychological mood state of healthy adults. The study sample consisted of 136 adults, who took part in two group exercise programs: 1) high-intensity dance aerobic exercises ($n = 59$) and 2) moderate-intensity dance aerobic exercises ($n = 77$). The questionnaire used for data collection was the Profile of Mood States inventory (POMS), by McNair, Lorr and Droppleman (1971) modified for the Greek population by Zervas, Ekkekakis, Psychoundaki, and Kakkos (1993). The subjects filled in the questionnaire before and after participating in each program. The repeated measures ANOVA analysis showed that there was a statistically significant difference in the psychological mood state of the sample, before and after the subjects' participation in both programs. More specifically, there was a decrease in tension, depression, aggressiveness and confusion and, on the contrary, an increase in energy, while fatigue was kept on the same level. It can be concluded that both dance aerobics programs positively enhance the participants' mood state and can be used for the improvement of psychological mood of adults, offering, at the same time, a variety to aerobics classes.

INTRODUCTION

Dance aerobics is an entertaining and non-competitive group activity, which has become very popular in recent years. Participation in group aerobic programs contributes to the improvement of cardio-respiratory stamina and prevention of cardio-vascular diseases in people of all ages who train with the adequate intensity, duration and frequency [24]. Recent studies indicate that group aerobic programs have a positive effect on the participants' quality of life and mental health [1, 11]. This popular type of exercise, accompanied by music, decreases tension, confusion and depression and increases energy levels [10, 23].

Mood improvement is a primary advantage derived from participating in physical activity programs without requiring a long-term participation. Nevertheless, both long-term and short-term participation improve physical fitness, body image satisfaction, self-efficacy and decrease the sense of anxiety and depression [5, 7]. Thayer, Newman and McClain [21] report that exercise appears to be the most effective strategy for regulating a positive mood in healthy adults.

Various studies have examined whether the type of exercise, its duration, intensity and environment are related to the decrease of tension and mood improvement. Pierce and Pate [18] examined with the use of the Profile of Mood States

inventory (POMS) the mood of elderly women who participated in a sixty-minute dance aerobics program. The results revealed a decrease in her tension, depression, fatigue and aggressiveness and an increase in energy and positive mood. Netz and Lidor [17] studied the mood of 147 healthy women aged 30-50 years, after their participating in five different activity programs (yoga, Feldenkrais Method, dance aerobics, swimming and computer classes as a control activity). The results showed that there was a statistically significant mood improvement following swimming, Feldenkrais Method and yoga classes, but not following aerobics and computer classes. A similar study, using the POMS, was carried out by Berger and Owen [6] on college students participating in swimming, yoga, body conditioning and fencing programs, after a single session of exercise. The results revealed that Hatha yoga decreased anxiety, depression and confusion; swimming tension and confusion; and fencing improved aggressiveness. The researchers suggest that the type of exercise and participants' experience can significantly decrease tension.

Berger and Motl [3] suggested that moderate intensity exercise was associated with a greater mood improvement. Steptoe and Cox [20] used a sample of 32 women after an 8-min high intensity exercise, which increased anxiety and fatigue and an 8-min low intensity exercise, which increased energy. On the contrary, Kennedy and Newton [12] observed that people who participated in high intensity step aerobics programs reported less fatigue and aggressiveness than those who participated in low intensity exercise programs.

Berger and Owen [4] studied the effect of low and moderate intensity exercise on mood changes before and after a 20-min run. The results revealed no significant differences between the two types of exercise intensity. Nonetheless, Lane and Lovejoy [13] report that the familiarization of participants with certain types of exercise and their settings produce a more positive mood.

In Greece, there no scientific data have been gathered concerning the mood of people before and after their participating in group aerobics programs in fitness clubs. The aim of the present study is to examine the effects of dance aerobics exercises on mood changes before and after participating in a single dance aerobics session of moderate and high intensity. It was assumed that: a) there would be a decrease of the factors affecting the mood in a

negative way and an increase in energy; and b) moderate intensity dance aerobics programs would produce more positive effects than those of high intensity.

METHODS

Participants

The study sample consisted of 136 healthy subjects (50 men and 86 women) aged between 22-40 years (mean age = 28.5, SD = 4.78). Each subject had already been participating in one of the two following group exercise programs for the last six months three times a week: 1) a high intensity dance aerobics program (59 subjects, 16 men and 43 women); and 2) a moderate intensity dance aerobics program (77 subjects, 36 men and 41 women). The study was carried out in a fitness health club in Athens under the supervision of specialized instructors.

Instruments

The questionnaire used for data collection was the Profile of Mood States (POMS) inventory by McNair, Lorr and Droppleman [14] modified for the Greek population by Zervas, Ekkekakis, Psychoundaki, and Kakkos [25]. The questionnaire consists of 37 items, which explore six factors: tension (6 items), depression (8 items), anger (7 items), energy (6 items), confusion (5 items), and fatigue (5 items). All the factors interpret the overall psychological Mood State. Responses to the questionnaire items were marked on a 5-point Likert scale (0 – not at all, 1 – little, 2 – moderately, 3 – fairly and 4 – exceptionally).

Procedure

The subjects filled in the same questionnaire 10 min before and 10 min immediately after the completion of their exercise session. The two types of exercise programs that were used in this study lasted 60 minutes and consisted of a 10-minute warm-up with stretching exercises, 30-minute routine dance exercises, 10-minute musculoskeletal exercises and 10-minute cool down, all supervised by a professional instructor. The intensity of both programs was defined by the beat of the music: 140-150b/min for the high intensity program and 130-135b/min for the moderate program.

Statistical analysis

The SPSS 12.0 statistical software package was used in statistical analysis. The statistical methods included reliability analysis and one-way ANOVA to investigate the differences in the subjects' psychological mood state before participation. A repeated measures ANOVA was also used to determine differences in the psychological mood state between the two measurements (before and after an exercise session) for the two different programs. The level of statistical significance was set at $p < 0.05$.

RESULTS

The internal consistency of the questionnaire measured with Cronbach's alpha was satisfactory. The values of all six factors, before participating in the programs varied from 0.73 to 0.89, while the values of the same factors after participating in the programs varied from 0.72 to 0.85. The one-way ANOVA was applied to check whether there were any significant differences in the psychological mood state among participants at the initial measurement. The findings revealed that there were not any significant differences in the psychological mood state of adults before participation. The repeated measures ANOVA was applied to check

the statistically significant impact of the variable Measurement (initial-final) on the overall mood of the participants and to trace any statistically significant differences between the two programs. The results showed that there was a statistically significant improvement in the mood of the participants in both programs, in all six factors.

More specifically, there was a statistically significant correlation between measurement and program type ($F_{1,134} = 11.16$; $p < 0.05$) in relation to the anxiety/tension factor. There was also a statistically significant influence of the repeated variable 'Measurement' on both high ($F_{1,134} = 202.31$; $p < 0.05$) and moderate dance aerobics programs ($F_{1,134} = 64.15$; $p < 0.05$). A statistically significant decrease of anxiety/tension was found in both programs, the higher being the one after the high intensity program (Table 1). In relation to the factor Depression, the measurements revealed a statistically significant influence of the repeated measurement factor ($F_{1,134} = 238.49$; $p < 0.05$), of the Aggressiveness factor ($F_{1,134} = 129.98$; $p < 0.05$) and of the Confusion factor ($F_{1,134} = 211.22$; $p < 0.05$), likewise (Table 1). There was a decrease in depression, aggressiveness and confusion after participating in the programs. As far as the Fatigue factor was concerned, the results did not indicate any statistically significant differences ($F_{1,134} = 1.23$; $s = 275$; $p > 0.05$), before and after both programs (Table 1).

Table 1. Means (M) and standard deviation (SD) of factors between measurements before and after participating in two different exercise programs

Factors	High intensity dance aerobics		Moderate intensity dance aerobics	
	Before	After	Before	After
	M (SD)	M (SD)	M (SD)	M (SD)
1. Tension /Anxiety	1.14 (0.55)	0.44 (0.33) ^{*b}	1.18 (0.53)	0.79 (0.32) ^{*a}
2. Depression	1.12 (0.43)	0.66 (0.37) [*]	1.15 (0.36)	0.69 (0.28) [*]
3. Aggressiveness	0.95 (0.49)	0.58 (0.35) [*]	0.93 (0.39)	0.62 (0.31) [*]
4. Energy	1.73 (0.58)	2.55 (0.50) ^{*b}	1.78 (0.62)	2.36 (0.45) [*]
5. Fatigue	1.21 (0.51)	1.18 (0.61)	1.24 (0.57)	1.21 (0.51)
6. Confusion	1.14 (0.34)	0.61 (0.28) [*]	1.12 (0.39)	0.63 (0.33) [*]
Total	103.85 (1.13)	100.87 (1.22) ^{*b}	103.94 (1.27)	101.61 (1.16) ^{*a}

Total = Tension /Anxiety + Depression + Aggressiveness + Fatigue + Confusion – Energy + 100).

'a' and 'b' indicate statistically significant differences between the two programs.

* statistically significant at $p < 0.05$.

The data analysis for the Energy factor indicated a statistically significant correlation between measurement and type of program ($F_{1,134} = 8.43$; $p < 0.05$). There was also a statistically significant impact of the repeated variable 'Measurement' on both high ($F_{1,134} = 231.41$; $p < 0.05$) and moderate dance aerobic programs ($F_{1,134} = 89.46$; $p < 0.05$). There was a statistically significant increase in Energy scores in both programs, the higher being the one following the high intensity program (Table 1).

To calculate the Total Mood State all six factors were measured in the following way: Tension/Anxiety + Depression + Aggressiveness + Fatigue + Confusion – Energy + 100. A repeated measures ANOVA (measurement \times type) of TMS scores showed a statistically significant correlation between measurement and type of programs ($F_{1,134} = 9.33$; $p < 0.05$). There was also a statistically significant influence of the repeated variable 'Measurement' on both high ($F_{1,134} = 551.83$; $p < 0.05$) and moderate intensity dance aerobics programs ($F_{1,134} = 272.35$; $p < 0.05$). The results revealed a significant improvement in the Total Mood State in participants in both programs. In addition, both programs produced significant mood enhancement, which was greater in the high intensity dance aerobics program.

Finally, no statistically significant differences related to the participants' sex and age were found. The overall psychological mood state of the subjects improved because the factors which negatively affect the psychological mood state were removed (Table 1).

DISCUSSION

The results of the study showed that after participating in both programs, in a single session, the subjects demonstrated a statistically significant decrease in the mean values of the factors of anxiety/tension, depression, confusion and aggressiveness; an increase in energy and no differences in fatigue. The statistically significant increase in energy and the decrease in the negative factors after participating in both programs resulted in a general improvement of the subjects' mood state (Table 1). These results confirm the initial hypothesis that participating in high and moderate intensity dance aerobics programs decreases the effect of negative factors and increases energy.

These results are in line with earlier study results providing evidence for mood-enhanced benefits of exercise [15, 19]. Thayer et al., [21] reported that exercising is an effective way to change bad mood and decrease anxiety and stress. Berger and Owen [6] also suggested that any kind of exercise offered a sense of satisfaction, reduced tension and increased energy.

Nevertheless, the results of the present study showed that high intensity dance aerobics programs induce a greater improvement of the mood state than the moderate ones. These results are in accordance with those of Kennedy and Newton [12], who reported that high intensity step aerobics programs increased energy and reduced tension more than low intensity ones. Similarly, Dyer and Crouch [9] noted that runners and aerobics dancers improved their mood significantly when exercising with high intensity. Boutcher and Trenske [8] stated that music improved mood and performance on moderate and difficult workouts. Weintraub [22] reported that both instructors and participants preferred taking part in high impact dance aerobics programs because they experienced a sense of euphoria while exercising and a sense of contentment after the end of the programs. Likewise, many researchers suggested that participating in dance aerobics programs of high or moderate intensity and listening to pleasant music increased stamina and effectiveness and decreased tension, resulting, thus, in a general improvement of the mood state [2, 16].

In conclusion, the results of the present study show that participating in group exercise programs of both high and moderate intensity improves the total mood state and reduces negative factors. This is also a way to encourage adults to become more active and healthier.

There are still some limitations in this study. The intensity of exercise was defined by the beat of the music. Heartbeat measurements are also possible but they were not considered important at this primary stage. The sample of 136 participants consisted of active, healthy adults, both males and females, of various social backgrounds. Still, no significant differences were observed concerning subjects' age or sex.

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