

GYMNASTICS, GREEK TRADITIONAL DANCE AND TENNIS AS LEISURE-TIME PHYSICAL ACTIVITIES: WHICH ONE TRIGGERS THE MOST POSITIVE PSYCHOLOGICAL RESPONSES?

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Original article

Abstract

Participating in leisure-time physical activity (PA) is thought to positively associate with mental health. The aim of the present study was to investigate the acute psychological responses of adults who take part in different types of leisure-time PA (gymnastics; Greek traditional dance; tennis). A total of 277 adults, aged 18-65 years ($M= 35.9$, $SD= 12.76$ years), taking part in Greek traditional dance ($n=89$), gymnastics ($n=88$), or tennis ($n=100$) volunteered to participate. In order for potential changes in participants' positive well-being, psychological distress and perceived fatigue to be examined, the Subjective Exercise Experiences Scale (SEES) was administered before and after a session of the aforementioned programmes. The 3 (group [gymnastics vs Greek traditional dance vs tennis]) X 2 (time [pre-test vs post-test]) analyses of variance that were performed on the SEES subscales (positive well-being; psychological distress; fatigue) revealed practically significant improvements in the positive well-being for all participants ($p<.001$, $\eta^2=.25$) and statistically significant interactions (though not of practical importance) between group and time in positive well-being ($p<.001$, $\eta^2=.068$), psychological distress ($p<.05$, $\eta^2=.02$) and fatigue ($p<.05$, $\eta^2=.033$), with participants in gymnastics presenting the most optimal results, followed by those of Greek traditional dance. Although further research is needed to fully understand the features of a PA/exercise that lead to the greatest boost in people's well-being, taking into account the growing prevalence of mental health disorders in our society, encouraging adults to join in a leisure-time PA/exercise programme seems imperative for their (psychological) health benefit.

Keywords: *positive well-being, psychological distress, perceived fatigue.*

INTRODUCTION

Mental health is defined as “a state of (psychological) well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community.” (World Health Organization; WHO, 2005). Based on the above

definition, mental health should be considered very important for public health, societal well-being, and economic development (WHO, 2013). Nevertheless, nowadays, many people suffer from mental disorders, with depression being among the main factors of disability worldwide (WHO, 2005). In the WHO European

Union alone, 44.3 million people present depression and 37.3 million present anxiety (Vos et al., 2016).

Among the factors that are thought to positively associate with mental health is physical activity (PA) (Bize, Johnson, & Plotnikoff, 2007; Ohrnberger, Fichera, & Sutton, 2017), with the domain in which PA takes place playing an important role (White et al., 2017). Specifically, leisure-time PA that provides people with positive feelings, is related with self-efficacy (DeBoer, Powers, Utschig, Otto, & Smits, 2012; Delahanty, Conroy, Nathan, & Diabetes Prevention Program Research Group, 2006; Middelkamp, van Rooijen, Wolfhagen, & Steenbergen, 2017), provides opportunities to interact with other people (Bailey & McLaren, 2005) as well as escape from stressful lives (Leith, 2010), is more strongly associated with psychological benefits than other domains, such as transport PA, work PA or household PA (Asztalos et al., 2009; Kull Ainsaar, Kiive, & Raudsepp, 2012; Ohta, Mizoue, Nishima, & Ikeda, 2007; White et al., 2017).

In a recent large-scale study (Chekroud et al., 2018), it was found that people who physically exercise, have approximately 43% fewer days/per month of poor mental health than those who do not exercise. Moreover, sufficient research evidence supports the value of several types of leisure-time PA and physical exercise, such as popular team sports (Chekroud et al., 2018), tennis (Groppe & DiNubile, 2009; Yazici, Gul, Yazici, & Gul, 2016), dance (e.g., ballroom dance [Haboush, Floyd, Caron, LaSota, & Alvarez, 2006], Greek traditional dance [Mavrovouniotis, Argyriadou, & Papaioannou, 2010]), aerobic exercise (Broman-Fulks, Berman, Rabian, & Webster, 2004; McAuley et al., 2000), and mindful exercise (Hofmann, Sawyer, Witt, & Oh, 2010) for positive psychological outcomes. It is interesting to note that several researchers report that even one single session of leisure-time PA/ physical

exercise, such as aerobic gymnastics (Genti, Goulimaris, & Yfantidou, 2009; Lox & Rudolph, 1994; Netz & Lidor, 2003; Panagopoulou, Charalampopoulos, Piperidou, & Rokka, 2016; Rokka, Mavridis, & Kouli, 2010), Greek traditional dance (GTD) (Genti et al., 2009), or mindful exercise (Netz & Lidor, 2003) can trigger positive psychological responses.

In Greece, 4.7% of population report that they suffer from depression (80.8% increase compared to 2009), 7.5% present stress disorders, and 1.7% have various mental disorders. Taking into account both the above worrying levels of mental disorders and the benefits of leisure-time PA, it would be useful to gather evidence regarding the type(s) of leisure-time PA with the most positive effects on the mental health of participants. For this purpose, evidence from experimental research comparing the acute effects of different programmes would be valuable, helping people choose the PA that best suits them and offers the most benefits. However, relevant published studies are limited to just a handful, with most of them examining programmes with several similarities, such as Zumba and Salsa dance (Domene, Moir, Pummell & Easton, 2016); dance aerobics, step aerobics, and aqua aerobics (Panagopoulou et al., 2016), or Pilates and yoga (Fotiadi, Petsa, Rokka, Mavridis, & Bebetos, 2017). Only two studies examine different types of PA/physical exercise, such as aerobics, GTD, and muscle strengthening with additional weights (Genti et al., 2009), or Zumba, hip-hop, body conditioning, and ice skating (Kim & Kim, 2007).

From the above, it is obvious that although aerobics has attracted researchers' interest, other popular types of PA/physical exercise have been investigated to a lesser extent (or even not at all). For example, the positive effects of GTD, compared to other programmes, were examined only in one study (Genti et al., 2009), although GTD is a type of PA

much-loved among Greeks. Another very popular type of exercise thought to offer plenty of health benefits for participants of all ages (Groppe & DiNubile, 2009; Kovacs et al., 2016; Pluim, Staal, Marks, Miller, & Miley, 2007) is tennis. Nevertheless, there is only one study examining the acute effects of tennis, focusing only on participants' physiological, not psychological responses (Murphy, Duffield, & Reid, 2014). Based on the above, the aim of the present study was to investigate the acute psychological responses of adults who participate in gymnastics, GTD, and tennis, in an attempt to shed light on the psychological benefits that can be gained from PA/physical

exercise programmes with different characteristics.

METHODS

A total of 277 adults (87 men; 190 women), aged 18-65 years ($M = 35.9$, $SD = 12.76$ years), who took part in GTD ($n=89$), gymnastics (Zumba [$n=42$] and Pilates [$n=46$]), and tennis ($n=100$) in Athens, 2-3 times per week, volunteered to participate. The age of participants by group as well as the years of their participation in the above programmes is presented in Table 1.

Table 1

Descriptive statistics of participants' age and years of participation in GTD, gymnastics and tennis.

	Greek traditional dance	Tennis	Gymnastics
Age	37.10 ± 10.70	31.18 ± 9.89	40.82 ± 13.23
Years of participation	2.21 ± 2.04	1.28 ± 1.07	1.59 ± 1.19

The Subjective Exercise Experiences Scale (SEES; McAuley & Courneya, 1994) that aims to assess subjective responses to exercise participation, adapted for the Greek population (Papaioannou et al., 2010), was used for data collection. The SEES consists of 12 items, answered on a seven-point Likert scale (1= "not at all", 4= "so and so" and 7= "very much"). Those items are classified by three factors: Positive Well-Being (PWB; 4 items), Psychological Distress (PD; 4 items) and Fatigue (4 items). The first two factors (PWB; PD) respond to the positive and negative sides of psychological health-wellness, whereas the third factor represents the perceived fatigue. SEES' construct validity (Mavrovouniotis et al., 2010; McAuley & Courneya, 1994) and internal consistency (Bartholomew, Morisson & Ciccolo, 2005; Mavrovouniotis et al., 2010) are well established.

First, informative meetings took place at sport/dance clubs (November 2016 - March 2017), in which potential participants were informed about the aim and the procedures of the study. Those who agreed to take part were provided with written consent forms for participation and asked to fill them in and sign. Within the next two weeks, the researchers re-visited the clubs and administered the SEES to participants 10 minutes before (pre-test) and 10 minutes immediately after (post-test) a randomly selected 60 minute-session.

Regarding data analysis, at a preliminary level, Cronbach's α index was computed to examine the internal consistency of the three SEES subscales in both pre- and post- tests. A value of $\alpha = .70$ was considered as the cut-off for accepted internal consistency (Cicchetti, 1994). Moreover, potential differences between the two types of gymnastics

(Zumba vs Pilates) on the three SEES subscales (PWB; PD; Fatigue) were examined, using analyses of variance with repeated measures. Their results revealed no significant interaction of time and gymnastics type ($p > .05$) nor significant main effect of gymnastics type ($p > .05$); thus, data of the participants in Zumba and Pilates were merged.

Then, 3 (group) X 2 (time) analyses of variance were performed on the SEES subscales scores to examine potential differences in participants' psychological responses due to the type of leisure-PA (gymnastics vs GTD vs tennis) they took part in. In cases of significant interactions, Bonferroni post hoc tests were utilized. The IBM SPSS 25.0 software package was used to perform data analysis and the level

of statistical significance was set at .05. Furthermore, effect sizes, with η^2 , were also utilized for data interpretation, following Cohen's (1988) cut-offs (values ≥ 0.14 are considered to show a practically significant effect).

RESULTS

The values of Cronbach's α for the three SEES subscales were above .70 in both measurements (PWB= .83 and .85; PD= .71 and .76; Fatigue= .84 and .85 for pre-and post-test, respectively), revealing sufficient internal consistency. In Table 2, means and standard deviations of participants in GTD, gymnastics and tennis on the SEES subscales are presented.

Table 2
Descriptive statistics on SEES subscales, by group.

	Greek traditional dance		Tennis		Gymnastics	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Positive Well-Being	21.62 \pm 4.01	23.12 \pm 3.95	21.93 \pm 3.85	23.35 \pm 3.92	18.97 \pm 4.6	22.64 \pm 4.35
Psychological Distress	6.71 \pm 3.64	5.93 \pm 3.40	6.66 \pm 3.00	6.58 \pm 3.45	7.55 \pm 3.58	6.10 \pm 3.40
Fatigue	9.25 \pm 4.09	10.52 \pm 5.19	9.00 \pm 4.61	11.43 \pm 5.18	9.45 \pm 4.77	9.63 \pm 4.57

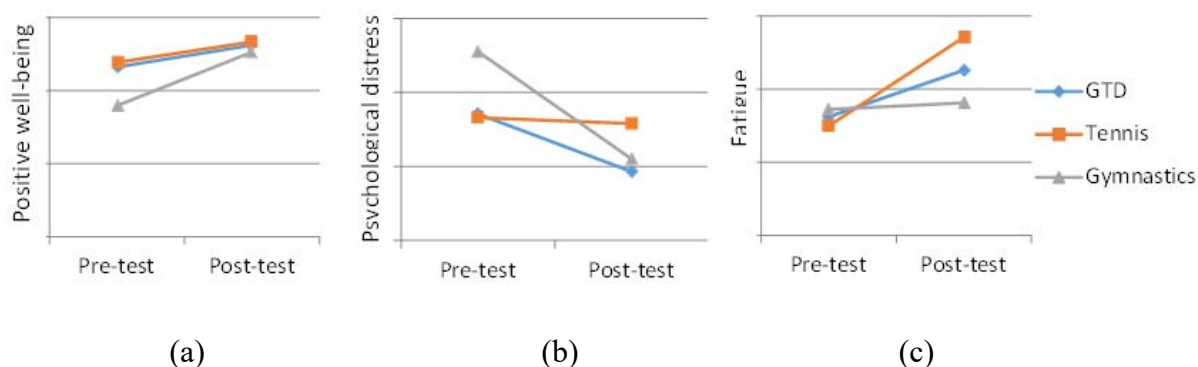


Figure 1. Alterations to PWB (a), PD (b) and Fatigue (c) per group.

Regarding PWB, the results showed a statistically significant interaction between group and time ($F_{2,274}=10.009$, $p < .001$, $\eta^2=.068$), and a statistically significant effect for both time ($F_{1,274}=90.71$, $p < .001$, $\eta^2=.25$) and group ($F_{2,274}=6.72$, $p < .005$,

$\eta^2=.047$). According to Bonferroni tests, although in the pre-test the gymnastics group had lower PWB scores than the other two groups, in the post-test all groups had similar scores. Moreover, all groups

presented statistically significant improvements ($p < .001$) (Figure 1a).

As far as PD is concerned, there was a statistically significant interaction between group and time ($F_{2,274}=3.72$, $p < .05$, $\eta^2=.02$) as well as significant main effect for time ($F_{1,274}=13.76$, $p < .001$, $\eta^2=.05$) but not for group ($p = .52$). Specifically, there was a statistically significant reduction in the PD of the participants in both gymnastics and GTD but not of those participating in tennis (Figure 1b).

As regards Fatigue, there was a statistically significant interaction between group and time ($F_{2,274}=4.61$, $p < .05$, $\eta^2=.033$), and a significant main effect for time ($F_{1,274}=18.04$, $p < .001$, $\eta^2=.06$) but not for group ($p = .52$). Bonferroni tests revealed that, although in the pre-test the three groups had similar levels of fatigue, in the post-test there was a statistically significant difference between the gymnastics and the tennis group. Furthermore, both the TGD and the tennis group had higher fatigue scores in the post-test compared to their pre-test scores; whereas the gymnastics group presented similar levels (Figure 1c).

DISCUSSION

The aim of the present study was to examine potential differences in the acute psychological responses of adults after different types of leisure-time PA (gymnastics, GTD, tennis). Provided the worrying levels of mental disorders nowadays and the potentiality of leisure-time PA and physical exercise to positively contribute to the psychological well-being of people, research evidence about the type(s) of PA/exercise that could lead to optimal improvements seems beneficial for public health, helping people choose a useful PA/exercise that suits them.

To begin with, our results revealed that, after a single session of gymnastics, GTD or tennis, the participants presented practically significant improvements in their positive well-being, thus supporting

the claim that leisure-time PA and exercise offer psychological benefits for people (suggestively: Asztalos et al., 2009; Kull Ainsaar et al., 2012; Ohta et al., 2007; White et al., 2017). Nevertheless, in PD and Fatigue, changes did not reach practical significance (Cohen, 1988). Moreover, statistically significant differences were noticed among the three programmes in the SEES subscales, with gymnastics presenting the most optimal results. Specifically, the participants in gymnastics had the greatest improvement in positive well-being compared to those participating in the other two programmes. Furthermore, a reduction in psychological stress was noticed only in the data of those taking part in gymnastics and GTD but not in the participants in tennis. Finally, those who danced or played tennis felt significantly more tired in the post-test than the gymnastics trainees. Similarly, Genti et al. (2009), who investigated potential differences in the acute impact of three different programmes (aerobics; GTD; muscle strengthening with additional weights) on the mood of adult participants, found that aerobic gymnastics and GTD caused more positive mood changes than the muscular strengthening programme.

Gymnastics, a popular, broad field of exercise, including various types, has been examined for its psychological benefits in several studies. In the present study, data of participants in Pilates and Zumba were gathered. Starting with Pilates, in a study by Fotiadi et al. (2017) it was revealed that one session of Pilates and yoga had equally significant impacts on reducing psychological stress and tension of trainees. Similarly, Domene et al. (2016) found that a lesson of either in Zumba or salsa dance conferred significant psychological benefits to physically inactive women. A higher acute psychological impact of Zumba and hip-hop compared to body conditioning and ice skating in young adults was also revealed in a study by Kim and Kim (2007). Positive outcomes of other types of aerobic

gymnastics are also reported in literature. For example, both Charalampopoulos, Panagopoulou, Loukou, & Rokka, (2016), who focused on aqua aerobics, and Panagopoulou et al. (2016), who compared the effects of dance aerobics, step aerobics, and aqua aerobics, concluded that this kind of exercise improves the psychological health and well-being of the participants and reduces their psychological stress and fatigue. In their large-scale study with approximately 1.2 million participants, Chekroud et al. (2018) concluded that, although every type of physical exercise is better than no exercise, certain types are more strongly related to psychological benefits than others, with aerobic gymnastics, popular team sports, and cycling being among the most beneficial for both those with typical mental health and those diagnosed with depression. Additionally, Bartholomew et al. (2005) found that a single moderate-intensity aerobics lesson led to reductions in anxiety, confusion, fatigue, tension and anger and a significant increase in the well-being and self-confidence of participants receiving treatment for depressive disorder. Thus, our results confirm previous studies and reveal that gymnastics can serve as an effective means for the improvement of people's psychological health.

Regarding GTD, our findings are in agreement with previous studies that have showed significant improvements in both young adults' mood state (Argiriadou & Mavrovouniotis, 2001, 2002) and old adults' quality of life (Mavrovouniotis et al., 2010) after a single GTD session. It is furthermore known that dance triggers several positive feelings that reduce psychological burden (Adilogullari, 2014; Domene, Moir, Pummell, & Easton, 2014; Quiroga Murcia, Kreutz, Clift & Bongarg, 2010; Payne, 2003; Steiner, 2003).

Concerning tennis, to our knowledge there are no published studies that investigate the acute psychological effects of a single session; and the relevant

literature regarding this type of exercise is quite limited. There is actually only one published study in which the impact of a 13-week tennis programme on mental health was investigated; it revealed positive results regarding stress and depression, especially in young athletes (Yazici et al., 2016). Nevertheless, in the present study, tennis presented the poorest results compared to gymnastics and GTD. Although Groppe and DiNubile (2009) claim that the emotional stress that characterizes tennis forces the player to develop an effective stress-copying capacity, it seems that this perspective does not optimally work in recreational adult participants.

A potential factor that contributed to the better scores achieved by the participants in gymnastics and GTD compared to tennis may be the use of music in these programmes. According to Boutcher and Trenske (1990), although the co-existence of both intrinsic and extrinsic information sources may impede the deep understanding of complex sport/dance skills, music seems to significantly reduce exercisers' psychological distress. That is why Rejeski and Kenney (1988) advocate the use of music during any kind of physical exercise. Perhaps a pleasant music could help participants in tennis avoid focusing on their fatigue and feel better. GTD provides the participants with the opportunity for socializing (Mavrovouniotis et al., 2008); thus, one would expect that GTD participants would present more positive psychological responses than the other two groups, but this did not happen. As Chekroud et al. (2018) underline, all types of physical exercise, including social and non-social ones, associate with lower mental health burden.

This study has some limitations that should be taken into account when interpreting its results. To begin with, the psychological responses of participants were recorded immediately upon completion of gymnastics, GTD and tennis

sessions. Follow-up tests that would have provided valuable information about the duration of the aforementioned positive impacts of the three programmes on the well-being of participants were not conducted. Moreover, although it is known that the duration of a session can influence the efficacy of a programme (Chekroud et al., 2018), in this study only 60-minute programmes were compared. Nevertheless, this study took place in naturalistic settings providing real-life data; it is the first study examining the acute effect of a recreational tennis programme and among the first comparing GTD with other programmes. Last but not least, in this study, three popular types of recreational PA/exercise that have different characteristics (gymnastics; dance; sport) were examined; thus, its findings can be helpful to people seeking different kinds of PA.

In summary, a single session of gymnastics, GTD or tennis seems to trigger positive acute psychological responses in terms of participants well-being. Gymnastics programmes appear to associate with the most optimal improvements, followed by GTD; whereas tennis presents the poorest results among the three leisure-time physical activities. Although further research is needed to fully understand the features of a PA/exercise that lead to the greatest boost in people's well-being, taking into account the growing prevalence of mental health disorders in our society, encouraging adults to join a leisure-time PA/exercise programme seems imperative for their (psychological) health benefit.

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