
Original Article

The effect of exercise on improving quality of life and self-esteem of inmates in Greek prisons

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ABSTRACT

The purpose of the study was to examine the effect of an exercise program on the quality of life and self-esteem of inmates in Greek prisons. Sixty male inmates randomly assigned in two groups (control and experiment). The duration of the training program for the exercise group was 12 weeks. Control group individuals did not participate in the exercise program. SF-12 quality of life questionnaire and the Rosenberg self-esteem scale were administered to both groups prior and after exercise intervention. The findings of this study support the beneficial effect of exercise on quality of life and self-esteem of inmates in Greek prison settings. **Keywords:** Prisoners, Physical activity, SF- 12, Rosenberg self-esteem scale.

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INTRODUCTION

According to the World Health Organization (2013), prison population throughout the world have increased exponentially over the last decade, with more than 10.35 million people imprisoned throughout the world, either as pre-trial or sentenced prisoners (Walmsley, 2016). The majority of prison population comes from poor and deprived and vulnerable social groups with approximately 21% being foreign nationals (Aebi & Delgrande, 2013).

Inmates exhibit a poorer health status compared to general population with a higher risk of morbidity, mortality and mental disorders due to intravenous drug use, alcohol misuse, smoking, and a significant reduction in physical activity partly due to imprisonment (Fazel & Baillargeon, 2011; Fischer, Butt, Dawes, Foster et al., 2011). Activity opportunities and occasions to practice sport regularly are very limited with a consequent difficulty for inmates to enjoy the positive effect of physical activity. In fact, most inmates are not motivated to do so or are unaware of what to do (Nurse, Woodcock, & Ormsby, 2003). As a result, they can be considered as a population presenting a high risk of inactivity related diseases occurrence such as heart conditions, obesity, hypertension, osteoporosis and diabetes (Lagarrigue, Ajana, Capuron, Féart, & Moisan, 2017).

In addition, researches showed that lack of physical activity affects negatively psychological status of inmates, as high rates of anxiety (Boothby & Clements, 2000), stress and depression (Plugge, 2006) and low levels of self-esteem (Igomu & Mayange, 2013) have been reported. Furthermore, aggression and antisocial behaviour are commonly reported among incarcerated prisoners (Haney, 2002; Hawkins, 2003). As a result of high levels of boredom, loneliness (Jamieson & Grounds, 2005) and insecurity (Marshal, Simpson & Stevens, 2000) self-harm and suicide (Daniel & Fleming, 2005) are common among prisoners.

There is evidence across literature of exercise beneficial effects on physical health due to regular participation in physical activities in detention environments. In particular, studies have shown a direct positive relationship between supervised cardiorespiratory exercise combined with resistance training and physical health in terms of improving physical fitness components of prisoners (Amtmann & Kukay, 2016) such as body composition and body mass index (Acevedo-Pabón, Manrique-Abril, & Ospina-Díaz, 2015), cardiorespiratory fitness, blood pressure and muscle strength (Perez-Moreno, Cámara-Sánchez, Tremblay, Riera-Rubio et al., 2007), flexibility, balance and agility (Bataglia, Di Cagno, Fiorilli, Giombini et al., 2013).

Regular participation in physical activities improves psychological health in detention environments too (Bataglia, Di Cagno, Fiorilli, Giombini et al., 2015) with positive mental health of inmates associated with higher level of general wellness (Leberman, 2007). Playing sport and taking part in physical activity may help inmates to distract or divert themselves from stressful situations (Basaran, 2016; Gallant, 2015), improve quality of sleep (Elger, 2009) and reduce aggression (Williams, 2015). Aerobic and anaerobic exercise may benefit on reducing anxiety and depression (Ghanbarzadeh & Mohamadi, 2012; Buckaloo, Krug, & Nelson, 2009) whereas yoga classes help to improve mood and decreased stress among prisoners (Bilderbeck, Farias, Brazil, Jakobowitz, & Wikholm, 2013; Harner, Hanlon, & Garfinkel, 2010). Sport involvement provides good opportunities to learn particular social skills, such as tolerance and respect of others (Svoboda, 1994) and it can contribute to enhance social inclusion of inmates and decrease sense of hopelessness (Cashin, Potter, & Butler, 2008).

Overall, exercise is associated with improving quality of life components of prisoners, with inmate participants exhibiting higher general quality of life perception compared to those who did not exercise (Obadiora, 2016), with both physical and mental components of inmates' quality of life associated with high levels of physical

activity (Mannocci, Mipatrini, D' Egidio, Rizzo et al., 2017) and improved self-esteem (Basaran, 2016; Verdoot, Champely, Clement, & Massarelli, 2010).

In Greece all studies evaluated health conditions (Athanasopoulou 2016), detention facilities (Geitona & Milioni, 2016a), mental status (Dandoulaki, Kosteri, & Milaki, 2008) and self-reported quality of life (Milioni & Geitona, 2017) and focused solely on presenting an overall picture of physical and psychological status of prisoners in Greek correctional institutions, with no interventions included in their research design. Geitona & Milioni (2016b) examined health status deterioration and mental health among men prisoners and noted raised levels of sadness, anxiety and discomfort. Milioni and Geitona (2017) reported a moderate to poor health status of women prisoners in Greece whereas Togas et al. (2014) assessed poor mental health as a component of health-related quality of life (HRQoL) and associated drug use to lower HRQoL. Fotiadou, Livaditis, Manou, Kaniotou and Xenitidis (2006) assessed intellectual functioning and measured the prevalence of current and lifetime mental disorder and deliberate self-harm among male prisoners using the Mini International Neuropsychiatric Interview (MINI), identifying a significant need to improve mental health services in Greek prisons. Furthermore, two other studies examined the burden and determinants of high smoking frequency among prisoners (Papadodima Sakelliadis, Sergeantanis, Giotakos et al., 2010; Makris, Gourgoulianis, & Hatzoglou, 2012).

However, reviewing the literature it seems that no other studies have been conducted so far including exercise interventions in their research design so as to examine their effect on improving physiological or psychological aspects of prisoners detained in Greek correctional institutions. The purpose of the study was to examine the effect of an exercise program on the quality of life and self-esteem of inmates and to proceed to related comparisons.

METHOD

The study was approved by the Ministry of Justice, Transparency & Human Rights of Greece and the DPESS University of Thessaly Ethics Committee Board.

Sample

The sample consisted of 80 male adults, aged 25 to 53 years old, and all inmates in Correctional Institution of Grevena, Greece. First, the prison's medical team conducted a preliminary medical examination of ninety (90) inmates with a previous time in prison at least 2 years and without prior participation in physical activity whatsoever. The purpose was to exclude inmates having any mental disease, cardiac disease, HIV/HCV infection, drug addiction, uncontrolled hypertension (blood pressure > 160/90 mmHg), diabetes or any other chronic disease. Eighty (80) of the total of 90 men met all the above-mentioned eligibility criteria.

Following, the sample was randomly assigned in two groups (control and experiment) of 40 participants each group, all selected randomly by drawing lots. Twenty (20) subjects (5 of the exercise group and 15 of the control group) did not complete the study due to their release from prison or transport to another prison during the study period, thus the final number of participants evaluated in post measures was 25 and 35 inmates for the control and experiment group, respectively ($N = 60$; mean age: 40.68 ± 8.15).

All participants agreed to sign the consent form of participation and completion of The Short Form-12 (SF-12) questionnaire and Rosenberg Self-Esteem Scale prior and after intervention.

Procedure

Exercise group

An initial meeting preceded exercise program initiation to provide information concerning the content and safety of intervention procedures and discuss the great importance of health and its relationship with physical activity.

The duration of the training program for the individuals of the exercise group was 12 weeks (Acevedo-Pabón et al., 2015) at a frequency of three (3) training sessions per week (Perez-Moreno et al., 2007) of 60 minutes each session (Bataglia et al., 2015), with the researcher leading exercise. The workout took place in all available indoor and outdoor facilities of Grevena Correctional Institution including a soccer field, an indoor gym and the prison yard. The materials used for the exercise included mats, free weights, resistance bands, medicine balls, swiss balls and ping pong tables.

Each session began with a 10-minute warm-up including walking, jogging and stretching exercises. The main part of each exercise session consisted of different activities each time to maintain interest and training effect. More specifically, these weekly exercise sessions included the following:

- a) Circuit resistance training with the participants rotated through a variety of exercise stations that engaged major muscle groups including sit-ups, pull-ups, dips, chest press, leg press, squats, abdominal crunch etc. Participants completed three circles in each session. Every exercise lasted 45-60sec, with 30sec interval between exercises and 2min between circles.
- b) Sport games participation in several team sport games, including basketball, handball, football, volleyball and ping pong.
- c) Musical games and Greek traditional dance activities requiring inmates to hold hands while formatting and moving in a circle. The purpose through music and movement was to develop enjoyment, communication and a sense of companionship developed through emotional expression and fulfilment as well as to promote dynamic balance, eye-hand and eye-foot coordination skills (Tsimaras, Giamouridou, Kokaridas Sidiropoulou, & Patsiaouras, 2012).

Finally, each session completed with a cool down period of ten minutes including breathing and relaxation activities. The overall purpose was to provide a moderate intensity program that produces positive mental and physical benefits for inmates (Nelson, Specian, Tracy, & DeMello, 2006) and fairly covers all aspects that constitute the general physical condition of participants.

Control Group

Control group individuals did not participate in any exercise program and they just continued the daily activities in prison (educational programs, remunerated work in kitchen or the laundries and general maintenance work) and they filled in relative instruments used for the purpose of the study, prior and after intervention.

Instruments

The instruments selected and administered prior and after the exercise program were the following:

The Short Form-12 (SF-12), which is a reliable and valid measure of health-related quality of life (QoL), that describes the domains of general physical and mental health status. The instrument contains 12 questions that provide two outcome measures, that is, a *Physical Component Score* (PCS) and a *Mental Component Score* (MCS) evaluating HRQoL (Ware, Kosinski, & Keller, 1994; 1996; 1998). The SF-12 has been already

used in studies evaluating quality of life of inmates (Mannocci, Masala, Mipatrini, Rizzo et al., 2015; Mannocci et al., 2017).

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) as used in Doganis, Theodorakis and Bagiatis (1991) study, that measures overall self-esteem and personal worthlessness by asking the respondents to reflect on their current feelings prior and after application of the exercise program. The Rosenberg Self-esteem Scale (Rosenberg, 1989) consists of ten items scaled on a four-point response structure (1 = *strongly disagree* to 4 = *strongly agree*), with higher scores reflecting more positive evaluations of the self (Rosenberg 1965). Five items are positively worded and five items negatively worded, in an attempt to inhibit response bias, that is, an individual's tendency to agree with statements regardless of their content. The Rosenberg Self-Esteem Scale has been already used in studies evaluating self-esteem of incarcerated people (Verdot et al., 2010) and its validity has been examined (Boduszek, Shevlin, Mallett, Hyland, & O'Kane, 2012).

Statistical analysis

Statistical analysis included the use of Statistical Package of Social Sciences (version 18.0). Kolmogorov - Smirnov analysis was used to examine the normal distribution of data. Since sample distribution was normal, a two-way repeated measures ANOVA (2x2) was conducted to locate possible differences existing between pre and post intervention measures in the examined variables. Level of significance was set at $p < .05$.

RESULTS

Test distribution according to Kolmogorov – Smirnov analysis was normal since no significant results ($p > .05$) for all variables were noticed (Table 1).

Table 1. Sample distribution and descriptive statistics ($N = 60$)

Variables	Pre-test		Post-test	
	<i>M</i> (<i>SD</i>)	Kolmogorov-Smirnov <i>Z</i> test (<i>p</i>)	<i>M</i> (<i>SD</i>)	Kolmogorov-Smirnov <i>Z</i> test (<i>p</i>)
Physical Health	17.10 (2.74)	.791 (.56)	17.58 (2.66)	1.257 (.09)
Mental Health	17.65 (2.18)	1.314 (.06)	19.33 (3.21)	1.153 (.14)
Self-esteem	3.68 (.54)	.720 (.68)	3.94 (.58)	.856 (.46)

M = Mean; *SD* = Standard deviation; *p* = Level of significance ($p > .05$)

Separate two-way ANOVAs with repeated measures were conducted to examine possible differences between pre and post intervention measures for all examined variables in both groups. Results revealed significant interaction of factors (variables and groups) on physical health ($F_{1,58} = 4.573$, $p < .05$, $\eta_p^2 = .07$), mental health ($F_{1,58} = 64.846$, $p < .001$, $\eta_p^2 = .53$) and self-esteem ($F_{1,58} = 43.696$, $p < .001$, $\eta_p^2 = .43$).

Analysing these interactions, results revealed significant differences on physical health ($F_{1,58} = 10.976$, $p < .01$, $\eta_p^2 = .16$), mental health ($F_{1,58} = 125.286$, $p < .001$, $\eta_p^2 = .68$) and self-esteem ($F_{1,58} = 101.250$, $p < .001$, $\eta_p^2 = .64$) between pre and post intervention measures (^{a, b, c}) only for the participants of the experiment

group, with significantly higher post-scores reported in all examined variables following the implementation of the exercise program as compared to pre-values (Table 2).

Table 2. Repeated Measures ANOVA results between and within groups

Variables	Group	Pre	Post
		(M±SD)	(M±SD)
Physical Health	Experiment	17.63±2.41 ^a	18.46±1.69 ^{a, d}
	Control	16.36±3.03	16.36±3.26 ^d
Mental Health	Experiment	18.17±2.04 ^b	21.31±1.75 ^{b, e}
	Control	16.92±2.22	16.56±2.71 ^e
Self-esteem	Experiment	3.68±.46 ^c	4.13±.46 ^{c, f}
	Control	3.68±.65	3.67±.62 ^f

^{a, b, c} Significant variable differences between pre and post measures for the experiment group ($p < .05$)

^{d, e, f} Significant variable differences between the experiment group and the control group in post measures ($p < .05$)

Furthermore, results revealed significant differences on physical health ($F_{1,58} = 10.555, p < .01, \eta_p^2 = .15$), mental health ($F_{1,58} = 68.353, p < .001, \eta_p^2 = .54$), and self-esteem ($F_{1,58} = 10.923, p < .01, \eta_p^2 = .16$) between the two groups in post (^{d, e, f}) measures. In particular, participants of the experiment group exhibited higher scores in all variables compared to control group participants following the implementation of the exercise program (Table 2).

DISCUSSION

The purpose of the study was to examine the effect of an exercise program on the quality of life and self-esteem of inmates with the findings supporting the benefits of regular participation in physical activities on the psychological health parameters measured for inmates in Greek detention environments.

Post results between the two groups showed the positive effect of the three sessions per week exercise program on both mental and physical quality of life components and self-esteem of experiment group participants. In particular, experiment group individuals reported as experiencing less problems with daily activities and feeling more energetic and vigorous compared to control group individuals who did not participate in training sessions, in agreement with psychological well-being benefits found in similar studies reporting improved physical and mental health (Mannocci et al., 2017; Obadiora, 2016; Perez- Moreno et al., 2007) and self-esteem scores (Basaran et al., 2016; Verdot et al., 2016).

Mannocci et al. (2017) investigated the time spent carrying out physical activity among inmates in Italian detention environments and its relation to QoL, whereas Obadiora (2016) examined the effect of football

participation on QoL perceptions among randomized inmates in Nigerian prisons and Perez-Moreno et al. (2007) studied QoL of Spanish prison inmates participating in a fitness program. All studies reported higher QoL life levels of physically active inmates compared to physically inactive ones. Similar results were noted in our study, showing that the positive effect of exercise on QoL physical and mental health components of prison populations is evident and independent from the different conditions existing among various detention environments and correctional institutions throughout countries.

Participation in exercise and sport can also help inmates to cope with prison conditions promoting in turn self-esteem levels. According to Nadoo and Willis (2009), low levels of self-esteem may lead inmates to engage in escape attempts or adopt risky behaviours such as taking drugs and develop an aggressive and violent personality.

Our findings similarly illustrate the positive effect of the exercise program on improving self-esteem level of inmate participants. More specifically, post measurements of the Rosenberg Self-Esteem Scale showed that experiment group inmates reported higher self-esteem following the implementation of the exercise program compared to the control group participants, in agreement with other studies.

Verdot et al. (2016) showed that physical exercise of moderate intensity as in our study contributes actively in improving self-esteem of detainees. Similarly, Basaran et al. (2016) using a variety of activities comprised of music, dancing, meditation, sports videos and activities and entertaining competitions underlined the importance of recreational activities and sports to improve self-esteem levels of inmates. On the other hand, Williams et al. (2015) having a sample of 24 young inmates found no changes of self-esteem following rugby intervention, however, self-esteem measure consisted of only one item that was not fully understood by all, leading author to suggest future researchers to use a multi-item scale better suited for this purpose. Our positive self-esteem findings are also consistent with previous researches using qualitative approaches of self-reports and interviews following sport and fitness programs (Meek & Lewis, 2014; Parker, Meek, & Lewis, 2014) and outdoor activities (Leberman, 2007) interventions.

The study appears the first of its kind as regards to examine quality of life and self-esteem of inmates in Greek prisons. Consequently, this constitutes the innovation and also the limitation of the study as it's the first one conducted in Greek correctional settings, thus, its findings can only be compared to similar studies conducted elsewhere.

Nevertheless, its results set the foundation for the systematic implementation of exercise programs in Greek correctional centres in the future. Future researches using larger samples of both male and female inmates and prisons with different security levels are needed to further verify the effect of exercise programs on improving psychological health parameters of inmates. Overall, engagement in physical activity has been found to be an effective tool for experiment group inmates of this study to increase self-esteem and improve quality of life components within prison.

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