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Assessment of Adult Physical Activity in Gym Exercise Programs

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Abstract

As populations' life expectancies continue to increase, a major concern is whether this extended lifespan includes healthy years and improves the quality of life associated with health in old age. The disease-preventative, well-being-enhancing, and rehabilitative benefits of physical activity are scientifically established and widely acknowledged. The aim of the study was to evaluate the physical activity of adults who regularly participated in individual exercise programs in a gym. The participants consisted of 20 men, aged 41.8±10.8 years and 30 women, aged 43±10.4 years. Participants attended gym exercise programs a minimum of three times a week. The evaluation was completed in one week. The TANITAAM-120E accelerometer was used to assess physical activity. The level of physical activity was assessed based on the daily number of steps. Results indicated that the participants' average number of steps per day was lower than the World Health Organization's (WHO) recommended 10,000 steps for adults. Physical activity did not vary significantly by gender, although women exhibited a slightly higher step count. The results suggest that mere involvement in exercise programs does not necessarily contribute to achieving the recommended levels of physical activity.

Keywords: Physical activity, exercise programs, pedometers, adults.

1. INTRODUCTION

Physical activity (PA) is characterized as "any bodily movement produced by the musculoskeletal system that results in energy expenditure" (Caspersen, Powell & Christensen, 1985). PA encompasses sport, as well as activities undertaken in the course of daily routines, employment, leisure, or active transportation, such as rapid walking or domestic chores. Exercise is a subcategory of PA that is planned, structured and repetitive and has the ultimate or intermediate goal of improving or maintaining physical fitness (Garber *et al.,*2011).

Numerous studies indicate that consistent engagement in PA offers various health advantages, such as enhanced muscle strength and cardiorespiratory function, improved bone density and functional capacity, and decreased stress and depression levels. In addition, PA contributes decisively to improving the quality of life (Anastasopoulou, Venetsanou, Koutsoumba, 2020; W.H.O., 2019).

Conversely, reduced engagement or avoidance in individuals with PA is closely related to the emergence of illnesses such as cardiovascular disease, stroke, hypertension, type 2 diabetes mellitus, osteoporosis, obesity, several cancers, anxiety, and depression, and is the fourth leading risk factor for mortality, causing 3.2 million fatalities globally per annum (W.H.O., 2022).

The prevalence of physical inactivity is increasing worldwide and has serious implications for the general health of the population and the prevalence of non-communicable diseases. Data from 122 nations indicated that fewer than one-third of individuals over 15 years of age were physically inactive; inactivity increased with age, was more prevalent in economically developed countries, and was more common among women (Hallal *et al.,*2012).

According to more recent data, it appears that around 31.3 % of adults worldwide are classified as insufficiently active (W.H.O., 2022). More specifically, around 1.8 billion adults (i.e. 31.3%) do not meet the recommendations for 150 minutes of moderate or 75 minutes of vigorous physical activity per week. This represents an increase of 5 percentage points since 2010 (from around 26 % to 31 %). This trend is concerning, and the projection indicates it could reach 35% by 2030 if the current growth rate is maintained. Women have higher rates of sedentary behaviour (33.8%) than men

(28.7%). The key indicator of 31.3% insufficient physical activity reveals that approximately one-third of adults globally do not meet the fundamental requirements for physical and mental health. Current trends emphasize the crucial need to reinforce policies and programs to encourage PA and meet the WHO 2030 goals (WHO, 2022).

In Greece, the prevalence of physical inactivity is notably high, with rates between 30.0%-39.9% in men and 40.0%-49.9% in women (Guthold, Stevens, Riley & Bull, 2018). Specifically, approximately 40% of adults fail to adhere to global physical activity guidelines, whereas 30% of adolescents exhibit inactivity. The prevalence of obesity is also high among individuals aged 16 and older; the WHO (2022) reports that 37.9% of Greek adults are overweight and 24.9% are obese (Magriplis, E., Bakogianni, I., Arvaniti, F. *et al.,*2025; Pavlidou, Papadopoulou, Alexatouetal., 2023).

According to the W.H.O. guidelines (2022), a healthy adult, aged 18 to 64 years, is considered physically active only if he or she achieves at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity physical activity per week, or an equivalent combination of these. Engaging in PA a minimum of three times per week is advised, along with muscle-strengthening exercises (e.g. resistance training, weights, or bodyweight exercises) twice or more weekly. Guidelines suggest that decreasing sedentary behavior as well as any additional physical activity, even brief ones, may provide benefits (Warburton, Nicol, & Bredin, 2006).

The findings of a recent Eurobarometer survey on the frequency of exercise or sports participation among EU citizens reveal that inactivity and sedentary lifestyles persist at an alarming rate across Europe and Greece. A survey of 1,014 individuals aged 15 and older revealed that nearly 80% did not engage in exercise. 53% indicated an absence of moderate physical activity, such as cycling, participation in a dance group, or gardening. And almost two out of ten Greeks spend at least 8.5 hours a day sitting (Eurobarometer, 2025).

The aim of the present study was to assess the level of PA associated with participation in gym exercise programs in adult participants.

2. METHOD

Participants

The participants of the survey were 50 adults (20 men and 30 women), aged 30-60 years, who agreed to participate voluntarily, after being informed about the purpose and content of the survey. All of the participants took part in fitness programs at the gym for an hour, three times weekly. Contact was established at their respective residences, places of employment, and social venues. The region of Central Macedonia served as the location for both the sample's residence and occupation. The educational attainment of the attendees spanned secondary and higher education. The body measurements of the participants are shown in Tables 1 and 2.

Table 1: Physical measurements of the women population

Women	Age (Years) M (Sd)	Weight (Kg) M (Sd)	Height (Cm) M (Sd)	Bmi M (Sd)
N (30)	43 (10,4)	66,9 (21,7)	166,5 (2,99)	24,18 (8,07)

Table 2: Physical measurements of the men population

Men	Age (Years) M (Sd)	Weight (Kg) M (Sd)	Height (Cm) M (Sd)	Bmi M (Sd)
N (20)	41,8 (10,8)	85,5 (10,5)	177,5 (3,72)	27,15 (3,32)

Materials

The TanitaAM-120E is a state-of-the-art, three-axis accelerometer that tracks METS, steps, distance traveled, and calories burned over a 24-hour period, based on Body Mass Index (BMI), regardless of whether users are walking, sitting, or sleeping. Results are stored for 7 days allowing users to evaluate their progress during the week. The accelerometer can be positioned in the pocket of any clothing or, for ease of use, in a handbag (Troiano, McClain, Brychta, & Chen, 2014).

Experimental procedure

The research procedure included measuring and assessing PA using the TanitaAM-120E pedometer, in addition to the measurement of body weight, height, and leg length.

Two sessions were scheduled with the participants during the testing. During their initial meeting, participants were asked to classify themselves according to the step/day index categories established by Tudor-Locke *et al.,* (2004) (Table 4) and to indicate whether they met the WHO's recommendations for PA (10,000 steps/day) (Craig *et al.,*2003). Following that, a pedometer was provided to each subject, along with instructions for utilization. Furthermore, measurements of anthropometric features were performed at the meeting. Body weight was assessed using a precision scale with an accuracy of 0.1 kg, while height was measured using a graduated stadiometer, accurate to 1 cm. BMI (BMI = kg/m2) and stride length were then determined. The delivery of the pacemeters by the participants took place at the second meeting.

The pedometers were worn by the participants for 7 consecutive days. Instructions specified that they were to wear the pedometer throughout the day, removing it only when bathing, swimming, or sleeping (Strath, Kaminsky, Ainsworth, 2013).

Statistical Analysis

The data were analyzed using descriptive statistics and an independent samples T-test. The significance level was established at p= .05.

3. RESULTS

Descriptive Statistics

The descriptive statistics showed that the average steps/day of the participants was 5,534, with a minimum number of steps/days of 3,216 and a maximum number/questions of 11,764, as shown in Table 3.

Table 3: Minimum, maximum and average steps/day

N=50	Minimum	Maximum	Average
STEPS	3.216	11.764	5.534

The ranking of the participants was based on the Tudor-Locke, Hatano, Pangrazi, &Kang (2008) step/day index.

Table 4: Daily rate

Steps/Day	Activity Level
>5.000	Sedentary
5.000-7.499	Inactive
7.500-9.999	A little active
≥ 10.000	Active

Consequently, the categorization of the survey participants is presented in Table 5.

Table 5: Classification of participants based on the Tudor-Locke *et al.*, table (2008)

Steps/Day	Participants	Percentage %
>5.000	0	0
5.000-7.499	36	72
7.500-9.999	8	15,9
≥10.000	6	12,1

Specifically, 72% of them had an income ranging from 5,000 to 7,499 steps/day 15,9% from 7.500-9.999 and 12% over 10,000 steps/day.

Regarding the participants' assessment of how many steps they take daily, all of them answered that they take 10000 steps or more and are in the "active" category based on the above categorization.

Effect of gender on PA based on number of steps/day

Table 6: Minimum, maximum and average steps per day for the women and men population

Gender	Minimum Steps/Day	Maximum Steps/Day	Average Steps/Day
MEN	3.499	6.126	4.601
WOMEN	3.216	11.764	6.000

As shown in Table 6, women had higher values than men, but there were no statistically significant differences between them (p=0.359).

4. DISCUSSION

Research has established that a lack of PA is strongly linked to the development of chronic diseases (Loprinzi, Walker & Lee, 2014, Lee, Fitzimons & Baker, 2013), and this deficiency has been ranked as the fourth leading risk factor contributing to mortality. The correlation between inactivity and diminished physical performance and the diminished quality of life of the general population and those with chronic diseases, coupled with the fact that 80% of the world's population is insufficiently active (W.H.O., 2022), suggests several outcomes. Consequently, efforts are directed toward the development and evaluation of lifestyle interventions that facilitate leisure-time PA and expand the population of adults adhering to public health guidelines for PA (Kahn, Ramsey & Brownson, 2002).

This study aimed to examine the PA of adults who participated in individual exercise programs in a gym. The sample comprised 30 women (60%) and 20 men (40%) aged 30-60 years who were enrolled in individual exercise programs at a gym, with a minimum attendance of three sessions per week. According to the results, the average number of steps taken by women was

6,000 steps/day and that of men was 4,601 steps/day. More specifically, 72% of the sample made between 5,000-7,499 15,9% from 7.500-9.999 and 12.1% over 10,000 steps/day. It is important to acknowledge that those who followed the 10,000 steps/day recommendations were employed in occupations that involved walking.

Six participants met the criterion of the number of steps associated with significant health benefits, having taken more than 10,000 steps/day. Eight made from 7,500-9,999 and are therefore classified as "a little active", while 36 participants made between 5,000-7,499 and are classified as "low active". Female participants showed higher values than male participants, but there were no statistically significant differences between them (p=0.359).

The present results are consistent with the study by Tudor-Locke, Sisson, Collova, Lee, & Swan (2005), which aimed to determine the necessary number and specific days for a reliable assessment of adult PA. Results indicated no statistically significant variance between males and females in daily steps or weekly averages.

In this study, it should be noted that all participants, when asked if their gym-based individual exercise programs met the W.H.O.'s 10,000 steps/day recommendation, responded in the affirmative (Prince *et al.,* 2008). However, the results indicated that the participants average daily step count was 5,534. In accordance with the mean and pedometer-determined activity index of Tudor Locke *et al.,* (2008) utilized to classify participants, they are categorized as "slightly active". This indicates that data from the accelerometer revealed a minimal number of individuals meeting the recommendations for adequate PA (Kelly, Fitzsimons, & Baker, 2016). The difference between subjective and objective measurement is probably due to the fact that the estimated PD from subjective measurements is not exclusively represented by steps, as has been shown by Vanhees *et al.,* (2005) who concluded that objective measurements are often not suitable for measuring complex movements, cycling, upper body movements or load transfer.

A key study outcome indicated that involvement in individual exercise programs, conducted for one hour per session, thrice weekly, falls short of the foundational public health guidelines that encourage at least 150 minutes per week of moderate-intensity, health-promoting physical activity. Consequently, adhering to the guidelines of 100 steps per minute, the result is 15,000 steps per week. With a baseline of 5,000 steps per day over seven days, and the addition of 15,000 steps per week, the average is 7,100 steps per day. Consequently, participation in supplementary sporting and recreational pursuits (e.g., walking, jogging, running, etc.) is advised to accomplish the recommended objective. (Prasad & Arura, 2021; Colley, *et al.,*2011; O'Donovan *et al.,*2010).

In conclusion, participation in individual exercise programmes in a gym does not appear to be sufficient for individuals to receive the health benefits of regular physical activity, such as weight control, improved mental health and mood, reduced risk of chronic disease and all-cause mortality (W.H.O., 2025).

Future studies may categorize the population of adults who exercise in a gym into more age and occupational groups to obtain more specific results.

Conflict of Interest: The authors declare no conflict of interest.

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