

The effects of weekly motivational phone calls on the amount of leisure sports activities and changes in physical fitness

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Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection.

Abstract

Purpose: The purpose of this study is to investigate whether motivational weekly phone calls are able to promote overall and/or leisure physical activity levels and fitness in an urban population of Romania.

Material: Sixty-five adult subjects (30 males and 35 females) were randomly selected and followed over the 8-month study period. Total physical activity and changes in body mass and body mass index (kg/m²) were recorded on a monthly basis. Fitness level was assessed by the participants themselves using three standardized motor tests: push-up test, 1-minute sit-up test and 3-minute step test.

Results: The intervention resulted in an increase of physical activity level by approximately 70% in males and females aged 25–39 years. In those aged 40–49 years physical activity levels were enhanced by 77% in males and 18% in females. These changes were associated with improvements (25–31%; $p < 0.01$) in fitness levels. Changes in physical activity over the 8-month intervention period were negatively correlated with body mass index ($r = -0.721$, $p < 0.01$).

Conclusions: This study demonstrates that motivation by regular phone calls was highly effective in increasing leisure sports activities and improving fitness levels in young and middle-aged adults of both sexes.

Keywords: leisure sports activities, physical fitness, adults, physical activity, body mass index, phone calls.

Introduction

The importance of regular physical activity (PA) is generally recognized in the prevention of many chronic diseases, such as diabetes, cardiovascular diseases and some cancers [1-3]. Additionally, adequate PA and leisure sports activity improves physical performance, self-confidence and physical and psychological independence [4] and contributes to 'quality of life', which comprises perceived global satisfaction and well-being [5]. Physical and leisure sports activities can favor various areas of well-being, such as physical, psychical as well as social well-being [6]. With respect to physical well-being, the type and intensity of physical or sport activity determines the way the human body adapts. Also, frequency and volume of PA are at least equally important. PA at a moderate intensity and engaging large muscle mass (e.g. walking) leads to general adaptations enabling the individual to better cope with the usual challenges of life (e.g. walking tasks, stair climbing) [7]. In contrast, if the goal is to improve physical fitness, sports activities performed at higher intensity are needed; these include, for example, running, jogging, swimming, cycling and aerobic gymnastics [8, 9].

From a health perspective, the World Health Organization (2017) [10, 11] recommends at least 150 minutes of moderate-intensity, or at least 75 minutes of vigorous-intensity aerobic exercise throughout the week or an equivalent combination of moderate and vigorous-intensity activity. The aerobic activity should be performed in bouts of at least 10 minutes duration. For

additional health benefits, adults are even encouraged to increase their moderate-intensity aerobic activity to 300 minutes per week, or engage in 150 minutes of vigorous-intensity aerobic exercise per week. Moreover, muscle-strengthening activities should be included involving major muscle groups on 2 or more days a week. As it is essential for PA to be undertaken on a regular basis for sustained improvements in health, ensuring that individuals are participating in activities that are a source of happiness and satisfaction is important for long-term adherence [12].

However, developing positive attitudes toward activity or sport is often a challenging task and strategies helping to overcome personal constraints are needed. Professional and regular counseling might be one strategy to start with. Such approaches, among others, include face-to-face exercise or behavioral/cognitive consultation, or motivational phone calls promoting physical and leisure sports activities [2, 13, 14]. With professional support and repeated contacts, which seem to be important for behavioral changes [8], people might overcome initial inhibitions, start being active or increase their activity level and continue to be active on a regular basis as they experience the benefits of being so (e.g. improved fitness level, health status) [15].

The evidence of regular phone calls to promote physical and/or leisure sports activities is strong, yet the optimal intervention dose (e.g., duration and frequency of telephone contacts) [2, 14] and the effect of the increased PA on physical performance has not yet been well studied. Thus, *this study aimed to investigate* whether weekly motivational phone calls for 8 months were able

to promote physical and/or leisure sports activities and to increase physical fitness in people aged between 25 and 49 years. We hypothesized that with weekly phone calls the physical and/or leisure sports activity level can be increased and that the individual level of physical fitness is related to active participation in leisure sports activities.

Material and methods

Participants: Overall, 500 adults (229 men and 271 women) aged between 25 and 49 years were randomly selected at different locations (in the region of Braşov, Romania) and were asked to voluntarily participate in the survey. Of these, 318 (149 men and 169 women) subjects were contacted during or after practising organized and non-organized leisure sports activities at different sports facilities (e.g. track and field facility, running trails) and 182 participants (81 men and 101 women) were randomly selected on the streets of Braşov. All subjects were handed out a questionnaire focusing on physical health and participation in leisure sports activities. The participants had to indicate how often they practised leisure sports per week (i.e. less than 1 hour, 1–2 hours, 3–4 hours, 5–6 hours) and only participants practising sports for 1 hour and 1–2 hours were included for further participation as we intended to investigate the effects of increasing leisure sports activities. Finally, 65 adults (30 men and 35 women) were included and these were split into two age categories: (1) 25–39 yrs (N = 27, 12 males and 15 females); (2) 40–49 yrs (N = 38, 18 males and 20 females). Of the 65 selected adults, 20 (10 men and 10 women) have been recruited on the street and the remaining 45 (20 men and 25 women), have been recruited after practicing sport. Baseline characteristics of the participants are shown in Table 1.

Table 1. Baseline characteristics of participants

Variable	Mean (SD) N = 65
Age (years)	35.2 ± 7.3
Male/female	30/35
Height (cm)	166 ± 8.5
Body mass (kg)	67.2 ± 10.7
Body mass index (kg/m ²)	25.2 ± 3.7
Leisure activity (total number/week)	2.1 ± 28

Organization of the research: The study period lasted for 8 months, from April 2013 to November 2013. During this time period participants were handed training logs and asked to daily record the type (what sport activities were attended: walking, running, hiking, fitness etc) and duration (in minutes) of their leisure time activities as well as their actual body weight. Everyday activities such as household, gardening and occupational activities were not questioned. Additionally, every month the participants performed a physical fitness test at home, as outlined in detail below.

After their engagement, participants were called by phone every week to motivate them to practice sport and additionally they received weekly information on all

sports activities (e.g. guided classes, sport events) where they could additionally participate during the course of the study. During the weekly phone calls participants were also asked to send their records via e-mail which they followed reliably. Phone calls were done always by the same researcher experienced in motivational phone calls, i.e., B.G.

The training logs were used to calculate the total PA over the 8-month study period as well as to establish changes in body weight and body mass index (BMI) (kg/m²). The fitness level was assessed by the participants themselves, with three standardized, simple and easy accessible motor tests [16]. The participants were advised/trained to correctly perform the test through written instructions and by video [16] sent via e-mail.

The motor tests were designed to evaluate muscle strength (dynamic) of the upper limbs and the abdominal muscles as well as endurance performance. The first test was a push-up test. After receiving the video, participants were given the following instructions: ‘Men should use the standard “military style” push-up position with only the hands and the toes touching the floor in the starting position. Women have the additional option of using the “bent knee” position. To do this, kneel on the floor, hands on either side of the chest and keep your back straight.

Lower the chest down towards the floor, always to the same level each time, either till your elbows are at right angles or your chest touches the ground. Do as many push-ups as possible until exhaustion. Count the total number of push-ups performed [16].

Women were given the option for the simpler test as it was assumed that not every woman would be able to perform the test in its original form.

The second test was a 1-minute sit-up test with the following instructions given to the participants. ‘Lie on a carpeted or cushioned floor with your knees bent at approximately right angles, with feet flat on the ground. Your hands should be resting on your thighs. Squeeze your stomach, push your back flat and raise high enough for your hands to slide along your thighs to touch the tops of your knees. Don’t pull with you neck or head and keep your lower back on the floor. Then return to the starting position. Count how many you can do in one minute [16].

The endurance performance was assessed by a 3-minute step test. The following instructions were given to the participants: ‘Step on and off the box (30.5 cm) for 3 minutes. Step up with one foot and then the other. Step down with one foot followed by the other foot. Try to maintain a steady four beat cycle. It’s easy to maintain if you say “up, up, down, down”. Go at a steady and consistent pace. At the end of 3 minutes, remain standing while you immediately check your heart rate. Take your pulse for 1 minute (e.g. count the total beats from 3 to 4 minutes after starting the test) [16].

The outcomes of the tests have been rated according to tables presented on the site [16]. For the purpose of analysis the rating for each test has been replaced by numerical numbers (scores) as follows: *very weak* – score 4; *weak* – score 5; *below average* – score 6; *average*

– score 7; *above average* – score 8; *good* – score 9; *excellent* – score 10. A rating of 30 indicates overall excellent physical fitness and a rating of 12 overall very weak physical fitness for the three motor tests.

Statistical analyses: Statistical analyses were conducted by SPSS (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). Data are presented as means (SD). Normal distribution of data was confirmed by using Kolmogorov Smirnov test. Paired t-tests were used to evaluate changes from pre to post 8 months of intervention. Correlation analyses (Pearson) were used to evaluate the relationship between variables (fitness levels and BMI). A P-value < 0.05 was considered to indicate statistical significance.

Results

Changes in PA, fitness level and body composition in the course of the 8 months intervention period are shown for the two age groups in Table 2. The intervention resulted in a self-reported increase in PA by about 70% in males and females of the younger age group (25–39 years). In the 40–49 years age group, males increased their PA level by 77%, whereas females increased it by only 18%. For the 25-39 years age group, the number of sport activities practiced per week increased from 1.6 to 2.7 in males (N = 12), and from 1.5 to 3.2 in females (N = 15). For the 40-49 years age group, the total number increased from 1.3 to 2.3 in men (N = 18), and from 1.4 to 3.2 in women (N = 20).

After the intervention, the general fitness levels were increased by 25–31% in males and females of both age groups. Prior to the intervention, BMI was slightly elevated in both sexes of the younger age group and in middle-aged males. Increased PA over the 8-month intervention period was associated with a decrease in BMI by about 15% in the groups with elevated BMI and by 5% in middle-aged

females with an already normal BMI at the beginning of the study. Changes in PA over the 8-month intervention period were positively correlated with changes in fitness levels ($r = 0.835$, $p < 0.01$) and negatively with BMI ($r = -0.721$, $p < 0.01$).

Discussions

The main findings of this study are: (1) that motivation by phone calls in addition to providing information on sport events and facilities, was highly effective in increasing leisure sport activities in males and females aged 25–49 years and (2) that changes in the amount of leisure sports activities were closely and positively correlated with individual changes in fitness levels and negatively with BMI.

Numerous lifestyle intervention studies investigated the effects of motivational phone calls as well as individual counseling in addition to offering out-of-hospital exercise courses on health outcomes and PA levels [2, 17-19].

Studies reported that telephone intervention may indeed be effective in increasing PA [2, 14]. However, it was also found that well-organized hospital-based exercise programs compared to a home-based training intervention are more effective in improving exercise capacity in patients with heart disease and type 2 diabetes or in patients undergoing heart transplant [20, 21]. In addition, Burtcher et al. (2009) [22] found that in contrast to a non-supervised training programs with only one counseling session, which was not effective in improving physical fitness, weekly advice together with supervised exercise increased adherence, and more importantly also fitness. Present data show that weekly counseling alone, without supervised exercise, is also capable of improving adherence and, as a consequence, physical fitness.

The present findings are in accordance with Philippaerts et al. (1999) [23], who also showed that

Table 2. Amount of leisure sports activity, fitness level and body mass index (BMI) pre and post 8 months of intervention

Variable	Age Group			
	25–39		40–49	
	Male Mean (SD) N=12	Female Mean (SD) N=15	Male Mean (SD) N=18	Female Mean (SD) N= 20
BMI pre (kg/m ²)	25.37 ± 3.02	25.1±4.05	27.33±3.4	23.05±2.7
BMI post (kg/m ²)	22.57* ± 2.2	21.86*±2.6	23.9* ± 2.5	21.9*±2.4
Total PA pre (total number of sports activities per week)	1.6± 0.7	1.5±0.6	1.3±0.8	1.4±0.7
Total PA post (total number of sports activities per week)	2.7*±0.9	3.2±1.5	2.3*±1.2	3.2*±1.5
Fitness pre (3 motoric tests- summary score)	14.1±1.2	13.8±1.3	13.8±1.1	13.3±1.1
Fitness post (3 motoric tests – summary score)	28.5*±2.2	27.8±2.8	27.2*±2.7	26.9*±2.9

* indicate significant changes from pre to post; all p values < 0.01.

PA = physical activity; BMI = Body mass index.

there is a relationship between PA during work and leisure time and several components of physical fitness. Additionally, Philippaerts et al. found that PA during work was modestly, but inversely related to adiposity. From a health perspective, increasing physical fitness and reducing adipose tissue is important as physical fitness and overweight are considered independent predictors of several cardiovascular diseases, diabetes mellitus and all-cause mortality [24–27]. Thus, the present results indicate that weekly counseling might be one preventive measure to improve health in the general population and hence to also reduce health-care-related costs [25].

Some limitations of the present study have to be mentioned. Our findings are certainly limited by the relatively small sample size and the uncontrolled nature of the study design. Additionally, the self-assessment of physical fitness and PA level might have led to some inaccuracies. Nonetheless, due to the personal and weekly contact with the participants, allowing the buildup of a trustful relationship with the awareness that only true data are the basis for good science, we are confident that the

participants honestly reported their PA and performance level.

Conclusions

The presented findings demonstrate that weekly motivation by phone calls in addition to providing information on sport events and facilities was highly effective in increasing leisure sports activities in both sexes of both young and middle-aged adults. Importantly, changes in the amount of leisure sports activities were closely and positively correlated with individual changes in fitness level and negatively with BMI. Therefore, implementation of the outlined practice may be recommended in order to improve performance capacity and health. However, if this implementation is able to reduce health costs cannot be appraised from this study and should be the focus of further investigations.

Conflict of interests

The authors declare that there is no conflict of interest.

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Cite this article as: Badicu G, Gatterer H, Balint L, Burtscher M. The effects of weekly motivational phone calls on the amount of leisure sports activities and changes in physical fitness. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2018;22(5):226–230. doi:10.15561/18189172.2018.0501

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Received: 06.02.2018

Accepted: 10.03.2018; Published: 30.09.2018