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Six-month effects of the Groningen active living model (GALM) on physical activity, health and fitness outcomes in sedentary and underactive older adults aged 55–65

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Abstract

Objective: To determine the effects on energy expenditure, health and fitness outcomes in sedentary older adults aged 55–65 after 6-month participation in the GALM program.
Methods: In three Dutch communities, subjects from matched neighbourhoods were assigned to an intervention ($n = 79$) or a waiting-list control group ($n = 102$). The GALM program consisted of fifteen 60 min sessions once a week emphasising moderate-intensity recreational sports activities.
Results: The intervention group showed significant increases in energy expenditure for recreational sports activities, other leisure-time physical activity, health indicators, and perceived and performance-based fitness. Contrary to our expectations, the same increases were found for the control group. Consequently, only significant between-group differences, favouring the intervention group, were obtained for sleep, diastolic blood pressure, perceived fitness score and grip strength.
Conclusion: The increases in energy expenditure for physical activity from the GALM program, especially for the more intensive recreational sports activities, look promising and are in line with the expected amounts necessary to improve health. Further research is needed to evaluate long-term effects of participation in the GALM program.
Practice implications: These results underline that GALM can be considered successful in stimulating leisure-time physical activity and improving health and fitness in older adults.

Keywords: Physical activity; Health; Fitness; Community-based strategy; Sedentary older adults

1. Introduction

Despite evidence that regular physical activity contributes substantially to health, functioning and quality of life of older adults [1–3], a large segment of the Dutch older adult population does not participate regularly in leisure-time physical activity [4–5]. Approximately 60% of Dutch adults aged 55–65 can be considered physically inactive, according to the 1998 American College of Sport Medicine (ACSM) recommendations for exercise and physical activity for older adults [3].

The Groningen active living model (GALM) was designed to recruit and stimulate leisure-time physical activity in sedentary and underactive older adults aged 55–65 [6]. After the recruitment phase, participants start with what can be characterised as a leisure-time physical activity program with an emphasis on recreational sports activities [2]. To assist the maintenance of physical activity in the

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GALM groups, it was assumed that the activities conducted should be tailored to participants' preferences and needs [7–9]. To this end, the GALM physical activity program was based on insights from social cognitive theory [10] and evolutionary-biological play theory [11]. The social cognitive mediating variables of self-efficacy, social support, perceived fitness and enjoyment were influenced through the structure and versatile content of the GALM program and the instructors' actions [6,12,13]. Evolutionary-biological play theory suggests that programs that fit the genetic potential of humans are most likely to succeed in developing a lifelong, physically active lifestyle.

Another reason for the versatility of the GALM program was that in this way several dimensions of fitness–like cardiorespiratory, muscular fitness and flexibility, all of which are important to older adults living independently–were addressed [3,14]. We assumed that by providing a versatile leisure-time physical activity program of moderate-intensity on average [15], participants would gain or regain enjoyment during leisure-time physical activities and develop preferences towards certain activities. When the GALM program succeeds in its role as a trigger, it can cause a transfer in participants becoming physically active more frequently outside the program [16,17].

Many studies have focused on the impact of physical activity programs on indicators of health and fitness in older adults, resulting in a large variety of reported effects [1,18]. Several factors that may account for this variation are diversity of program and subject characteristics, outcome measures and methodological issues. The purpose of this study was to determine the effects of 6-month participation in the GALM program on physical activity level and indicators of health and fitness in sedentary older adults aged 55–65. Based on the low initial levels of physical activity of the GALM participants [19], together with the characteristics of the GALM leisure-time physical activity program, we hypothesised that increased physical activity could lead to significant improvements in health and fitness outcomes [20,21].

2. Methods

2.1. Study design and subjects

A group-randomised trial was used. Based on urbanisation degree, number of persons in the 55–65 age category and population distribution, three municipalities were selected. In every municipality, the recruitment phase took place in four neighbourhoods that were assigned as intervention or control neighbourhoods. These 12 neighbourhoods were matched on number of older adults aged 55–65 living in that neighbourhood and socioeconomic status, and randomly assigned to study condition within matched pairs. Older adults from the six intervention neighbourhoods automatically became intervention group participants (IG). Correspondingly, older adults from the six control neighbourhood became control group participants (CG). The IG received the regular GALM strategy [6] and the CG started with the intervention after being placed on a waiting-list for 6 months.

The trial was designed to include 144 and 192 subjects in the intervention and control groups, respectively, taking into account corresponding expected dropout percentages of 20 and 40% with an alpha of 5% and a power of 80%. Based on experiences from former GALM projects, a total of 8504 potential participants were recruited using a special strategy to reach the calculated numbers of subjects in the IG and CG. All older adults received a written invitation and were visited at home by trained personnel. During this visit, potential participants were screened using a short questionnaire based on the 1998 ACSM recommendations on exercise and physical activity for older adults [3,22]. Older adults who were not sufficiently active according to these criteria were invited to participate in the study. Based on estimates of available demographic data, about 60% ($n = 5102$) of the older adults invited could be considered underactive according to the 1998 ACSM recommendations [3]. Half of this 60% ($n = 2551$) qualified for GALM. The other half was not interested in leisure-time physical activity or was unable to participate for reasons that included illness and personal circumstances [6].

A total of 315 older adults aged 55–65, i.e. 12% of the qualified individuals, participated in the baseline measurement; 181 of them (57%) also participated in the 6-month follow-up measurement (Fig. 1). Intervention group participants were distributed over 12 different GALM groups led by six different GALM instructors. Before starting measurements, a written informed consent was obtained from each participant. The study protocol was approved by the Medical Ethics Committee of Groningen University Hospital.

2.2. The GALM program

The GALM program can be characterised as a leisure-time physical activity program emphasising moderate-intensity recreational sports activities and consists of fifteen 60 min sessions at a frequency of once a week [15]. After the first 15 sessions participants are able to continue with a subsequent series of 15 GALM sessions. The recreational sports activities of the GALM program are based on national survey results on preferences of older adults towards certain recreational sports activities. The 15 most favourite recreational sport activities were incorporated into the GALM program (e.g. softball, dance, self-defence, swimming and athletics). The physical activities conducted were tailored by type, format, intensity and frequency to meet the wishes and needs of participants [6]. The structure of each GALM session was as follows: (1) a 5–10 min warm-up period; (2) 20–25 min of skills-practicing in which the exercises offered were differentiated for the level and needs