

Review

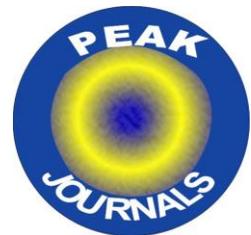
Review on interventional "nordic walking" exercise programs for improving life quality for older adults

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Accepted 15 July, 2016

Several article reviews have been made to document the effect of exercise on life quality of older adults, whereas very few reviews are available on the effect of nordic walking. The purpose of this review is to examine the interventional nordic walking exercise programs for older adults. This study focuses on whether nordic walking has positive effects on the strength of the upper and lower extremities, the cardiopulmonary function, the recovery from injuries, the body function, and consequently the quality of life. To examine the interventional programs, comparative review was used, based on the following criteria: (a) duration of interventional nordic walking programs, (b) interventional programs frequency, (c) duration of the effort to practice, (d) tests and measuring instruments of results [Fullerton test, etc.], (e) comparison of nordic walking to life quality of older adults. Older adults (< 60 years) are quite prone to muscle, bone and respiratory disorders which affect their quality of life. According to the investigations, improvement of their overall health and particularly of the cardio respiratory endurance has been observed when participating in nordic walking programs 3 times a week. Due to its intensity, nordic walking is considered the exercise that can bridge the gap between walking and running.

Key words: Osteoporosis, physical activity, functional health, balance, mobility.



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INTRODUCTION

It is commonly acceptable that physical activity improves the overall health and quality of life (Warburton et al., 2006). In the last twenty years a trend of low-intensity exercise has been observed, especially for the older adults. Walking with batons is a representative kind of this exercise that is gaining more and more ground in Greece. The story begins in 1966, when a physical education teacher at a school in Helsinki offered walking courses to students using ski batons (Karatopouzi and Toliás, 2016). In 1968-1971, at the Physical Education and Sports Science Department of the University of Jyväskylä (Finland), professor Leena Jaaskelainen started delivering courses on walking with ski batons, giving it the name "cross country ski style" and since then the basis for a series of new exercises has been set.

During 1973-1991, the same professor, as a member of the National Committee for Educational Affairs of the Ministry of Education introduced this activity on "New Physical Education Ideas" for schools (Karatopouzi and

Toliás, 2016). Then, in 1990 walking with batons became popular in Central Europe too. In 1997, the publication of articles in the specialized press begun and the name "nordic walking" has been adopted by the walking baton company, Exel. In 2000, International Nordic Walking Association (INWA) was founded involving 24 countries including Greece (Przyszlak, 2016). Nordic walking has three levels: (a) basic, (b) pleasure, and (c) race. In this review, the interventional programs shall show the following results: (a) whether basic nordic walking improves fitness for older adults, (b) strengthens the upper body, (c) strengthens shoulder mobility, and (d) whether the use of walking batons helps the body, so that older adults can walk for longer (Piech et al., 2014). According to the aforementioned researchers, Piech et al. (2014), nordic walking helps people who have osteoporosis, as it strengthens the bones and muscles. This review is a comprehensive reference on interventional programs through scientific articles, books,

magazines and websites studying the effect of nordic walking on the improvement of physical activity and therefore life quality for older adults.

Literature review

There are several studies examining the effect of interventional nordic walking programs for older adults (Kamien, 2007; Ossowski and Kortas, 2012; Ossowski et al., 2010; Walter et al., 1996; Collins et al., 2003; Mosti et al., 2011). Regarding life quality of older adults, many writers refer to the related "health life quality" (Ifantopoulos, 2001; Patrick and Ericson, 1993; Gitona et al., 2004; Hunt et al., 1986). The relationship between physical activity and quality of life for older adults is mentioned extensively in the following studies (Shephard, 1995; Krawczynski and Olszewski, 2000; Hall and Petruzzello, 1999). Kamien (2007) conducted a survey on two groups, aged 60-65 years, for two months. One group walked with batons and the other went for walking and running (without batons), which showed an overall improvement of physical function. However, the group that used walking batons had better results in terms of anatomical and physical parameters. According to a similar research, significant improvement was observed on the strength of shoulders and feet in 31 women, aged 60-69 years, who participated in a program for improvement of the strength of the upper and lower extremities. Nordic walking was used as part of the training, while strength was assessed with two selected tests of the Physical Fitness Test for Older Adults - Fullerton Functional Fitness Test (Kamien, 2007): (a) get up and sit on the chair 2 attempts, (b) rotation of shoulders with shoulder belt (Ossowski et al., 2010). The same test (Fullerton Functional Fitness Test) was used (Saulicz et al., 2015) in 84 women. 24 belonged to the control group and another 24 belonged to the experimental group. The experimental group participated in 10-60 min lessons of nordic walking for 4 weeks. Women were over 58 years old, in the climacteric period. Initial and final measurements were performed. Evaluation of the program was performed based on the Fullerton's test, which consisted of five exercises, including (a) assessment of resistance to the force: upper extremities (shoulders rotations) and (b) lower extremities (a 30 s Chair Stand), (c) assessment of flexibility of upper body (back), (d) and lower body (Chair Sit-and Reach) e) 6-minute walking, assessment of life quality was performed according to SF-36 (Short Form of Health Status Questionnaire). The results showed a significant difference in the experimental group rather than in the control group, regarding the strength of the upper extremities, flexibility and strength of lower extremities, as well regarding the quality of life. According to Ossowski et al. (2010), the main reason of instability is the deficient body balance. A survey conducted among women aged

60-69 years, separating them in two groups, 60-64 and 65-69 years old. After a six-month intervention program for the overall physical condition, researchers concluded that the age group 60-64 practiced nordic walking and had better results in agility and balance, improving it from 75 to 85 cm in relation to the 65-69 age group which followed a general fitness improvement program.

Nordic walking has beneficial effects on various problems caused by aging. A survey on a group of 20 men after blood vessel surgery, bypass surgery or infarction showed that after taking nordic walking lessons there was a 21% increase in energy consumption, increase in heart rate by 14 ud/min and high systolic and diastolic pressure increased to 16 and 4 mm Hg compared to walking without batons (Walter et al., 1996). Thus, walking with batons is safe for people suffering from heart problems. This is also the case for other studies (Collins et al., 2003; Mosti et al., 2011) on people suffering from peripheral vascular disease.

The use of batons in a 30 min lesson helped people to increase the distance they walked, along with intensity, resulting in high tolerance to physical effort and improvement of life quality of the patient. A survey conducted among women (Sprod et al., 2005) after mastectomy, concluded that the group practicing walking using batons has improved its strength in the upper part of the body in relation to the group which practiced walking without batons. In a similar survey conducted (Heikkila et al., 2004; Hartvigsen et al., 2010) among patients suffering from chronic LBP (low back pain), it was shown that an 8-week program was generally effective in reducing pain and improving the relative health.

A survey examined the therapeutic value of walking with batons (Nischwitz et al., 2006) in 6 women and 13 men aged 67 years with type 2 diabetes following an interventional program once or twice a week involving a 90 min walking with batons for a year. The results showed a significant improvement of all biochemical parameters associated with diabetes (Figard-Fabre et al., 2011; Gram et al., 2010). Significant improvement in the functional independence and life quality was observed for patients suffering from Parkinson. These patients participated in three 60 min sessions per week for eight weeks (Baatile et al., 2000).

The effect of walking with batons on weight loss for older adults is confirmed by a group of middle-aged who regularly participated in nordic walking courses for four months. Participants lost 4 kg on average and 6.6 cm from the waist, and their aerobic capability improved significantly (Heikkila et al., 2004; Hagner et al., 2009; Figard-Fabre et al., 2010). A similar survey (Wiech et al., 2010) conducted among 30 women aged 60-75 who regularly participated in the exercise program of nordic walking. The program was completed in 12 weeks and examined skin folds and circumference of pelvis. The conclusion was that nordic walking is a good way of

exercise for losing weight regardless of age and season. Note that the survey was conducted in winter when the fat percentage in women is increased in comparison to summer months.

Purpose and Hypothesis

The purpose of the study was to document, through interventional programs, the benefits of nordic walking on cardio respiratory function, balance, functional capacity, type 2 diabetes and obesity. The following questions help us word the hypotheses:

- (1) Is it possible for older adults to use nordic walking batons?
- (2) Does the participation of older adults in nordic walking programs 3 times a week improve their quality of life?

MATERIALS AND METHODS

The data collection process included the following:

- (1) At first, we search for English literature reviews that focus on the use of nordic walking as an interventional program, the duration of each program and how to evaluate programs.
- (2) Then, we searched for research articles which examined and documented the results of interventional programs on life quality of older adults.
- (3) Research was performed through the bibliographic databases of Pubmed, Google (beta/ scholar), Medline, Scopus and Science-direct, using several keywords: nordic walking, interventional, osteoporosis, third age, Quality of life, quality of life concepts, health status, Health Relate Quality of Life assessment, Fullerton test, overall health, etc.
- (4) The literature reviews were chosen based on the following criteria: (a) duration of nordic walking interventional programs, (b) interventional programs frequency, (c) duration of the effort to practice, (d) tests and measuring instruments of results [Fullerton test, etc], (e) comparison of nordic walking to life quality for older adults.

RESULTS AND DISCUSSION

From the above studies on the interventional programs it is important to interpret the level of independence of the older adults, which is determined by their ability to perform various daily physical activities and is considered an important factor in the quality of aging (Cunningham et al., 1993). Maintenance of fitness and the ability to participate in physical activities is equally important for health and quality of life for older adults (Goldberg and Hagberg, 1990). Elderly people involved in nordic walking exercise programs may maintain physical abilities in a

higher level, such as flexibility and strength, resulting in better mobility and more independence. In accordance with the literature review, kinetic independence and physical function are important factors in maintaining or improving the quality of life for older adults. No negative effect of nordic walking has ever been observed for the human body, which could raise awareness or concern regarding practicing nordic walking in any age. What should be taken into consideration, though, are the intensity, duration and frequency of nordic walking depending on the age.

Comparing interventional programs we observe that total duration of a nordic walking program is from 30 to 45 min; intensity is moderate between walking and running; and frequency is 3 times a week. All interventional programs improved the variables under research in relation to life quality.

Limitations

Review had the following limitations:

- (a) Refers only to interventional programs for nordic walking.
- (b) Refers to older adults.
- (c) Examines the effect of nordic walking on life quality.

Future research could focus on the review of interventional programs in general; that is, not only nordic walking, but also other activities that improve life quality of other age groups.

Conclusion and Recommendations

To sum up, our review of the following references presented the benefits of nordic walking for older adults through interventional programs. Among such benefits are improvement of cardio respiratory fitness, mental health, body weight, strength of the upper and lower extremities, kinetic function, and consequently quality of life. The overall health of participants with serious medical conditions (heart disease, hypertension) improved significantly after practicing nordic walking. Injury recovery time improved, as well. Communicating the benefits of nordic walking to people with various disabilities and medical problems over other aerobic sports is the main concern of physical education professors. It is important to associate early prevention through nordic walking to the implementation of interventional programs (model), which in the future could be applied to other age groups, such as the pregnant or the disabled.

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