

BENEFITS OF EXERCISE IN OLDER PERSONS AT PRIMARY LEVEL

ABSTRACT *The National Department of Health invited comments on proposed policy guidelines on the prevention of physical inactivity in older persons at primary level. The guidelines recommended the use of exercises which are dynamic, interesting, fun, easily implemented, safe and tailored to suit the individual needs. In order to make informed comments on the policy, the aim of this study was to evaluate the impact of the recommended exercise program among older persons in a local community over a six-week period. Promoting physical activity among the participants in the study resulted in marked improvements in systolic and diastolic blood pressures, and dominant hand grip strength. The time taken to perform some selected functional tasks also improved. The findings gave credence to the need to discourage physical inactivity among older persons, but there is need to overcome formidable methodological problems in evaluating the effects of exercise intervention among older persons in the community.*

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INTRODUCTION

In 1997, the National Department of Health in South Africa developed drafts of guidelines on three policies relating to older persons, and invited comments and/or input on the documents. One of the three policies was titled "Guidelines on the prevention of physical inactivity in older persons at primary level" (Department of Health, 1997). A major objective of the policy was the establishment of a comprehensive program for the prevention of physical inactivity. The document recommended the use of an exercise program that is dynamic, interesting, fun, easily implemented, safe and tailored to suit the needs of the individual. In addition, the program must not require any special equipment and should not need the supervision of highly skilled professional staff. The proposed policy identified that there are formidable methodological problems to be overcome in evaluating the effects of an exercise program, especially at primary level. However, the policy expects that the exercise program should be evaluated so that desirable physical activity habits could be reinforced by positive feedback.

The recommended exercise protocol included attendance at exercise classes 2-3 times per week, each session lasting for 45 minutes, and should include exercise to

music. Each session should start with a warm-up period of 5-10 minutes, and a cool-down period of a similar duration at the end of each session. The format of the exercise classes should include elements of endurance, low-resistance muscle strengthening and suppleness. In addition to the exercise sessions, desirable physical activity habits should be reinforced through health education, focussing on such issues as the benefits of exercise, importance of diet, tobacco use and stress management.

Physical inactivity is commonly reported among non-disabled older persons in Africa due to socio-cultural pressures and expectations (Amosun and Alawale, 1994). Twomey and Taylor (1984) highlighted the physical aspects of aging on body tissues, and the role of physiotherapy in health education and enhancement of adequate levels of physical activity among older persons. The authors reported the effects of physical activity on muscle bulk and strength, skeletal health and bone maintenance, range of movements of joints, cartilage compliance, soft tissue extensibility and neuronal efficiency. Other studies reported that exercises involving the practice of functional tasks and mobility produced substantial increases in strength, flexibility, and functional tasks like

chair rise, timed "up and go" test, and walking up and down a staircase (Skelton et al, 1994; Skelton and McLaughlin, 1996).

In spite of the impressive benefits of physical activity, literature has also indicated that older persons report a number of perceived socio-cultural, psychological, and health related barriers to physical activity (O'neil and Reid, 1991; Myers and Roth, 1997). It was therefore recommended that policy makers and exercise planners should take into consideration these perceived barriers as they may affect the successful implementation of any policy or exercise program.

Therefore, the aim of this study was to evaluate the impact of an activity program, that was based on the recommendation of the National Department of Health, on some cardiovascular parameters and functional abilities of older persons in a local community in the Western Cape. The outcome of the study will assist in making informed comments on the policy guidelines on the prevention of physical inac-

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tivity in older persons at primary level.

METHOD

The study was conducted among members of the Belhar Organisation for the Aged, a project for older persons run by the Western Cape Community Partnership Project (WCCPP). The project caters for older persons from three local communities, namely Belhar, Delft and Kuilsriver. The project runs a day care centre in Belhar where older persons are looked after by five community nurses from 09h00 to 15h00. An average of 50 persons are present each day, and they engage in activities such as sewing, knitting, prayers and singing.

Twenty five volunteers, aged 60-87 years, were certified medically fit to take part in the study. The views of the volunteers on exercise were sought (O'neil and Reid, 1991; Myers and Roth, 1997). This involved asking each volunteer during the pre-exercise screening if they thought exercise was important to maintain good health. Based on the outcome, the volunteers were divided into two groups, namely the exercise group who felt that exercise was important to their health, and the non-exercise group who felt exercise was unimportant and were automatically excluded from the study. The exercise group (n=18) include 11 females aged 65-87 years (mean=75.3; sd=9.9), and 7 males aged 60-84 years (mean=69.6; sd=7.1).

Data obtained during pre-exercise screening included lifestyle habits (daily physical activity pattern, smoking and drinking habits, regular medication), anthropometric (weight and height) and cardiovascular parameters (resting systolic and diastolic blood pressures, and resting radial pulse rate in sitting). Three indices of physical performance namely maximal handgrip strength (Amosun et al, 1995; Judge et al, 1996), chair rise (Skelton et al, 1995), and timed "up

and go" test (Skelton and McLaughlin, 1996) were measured to assess the functional abilities of the volunteers.

Maximal handgrip strength of the dominant hand was measured using a standard adjustable-handle, calibrated dynamometer (Takei Kiki Kogyo, Japan). The volunteers were in standing position, the elbow joint fully extended, the shoulder adducted and neutrally rotated, and the forearm held in the neutral position (Amosun et al, 1995). The volunteers were instructed to squeeze the handle of the dynamometer as hard as possible and to hold it for 5 seconds. Verbal encouragement was offered during the test by giving the command to "Pull, pull, pull". The dominant hand was tested twice and the higher reading was recorded for data analysis.

The time taken for each volunteer to complete 10 full stands from sitting on an armless chair was measured (Judge et al, 1996). The chair had a seat level of 0.42m from the floor. Timed "up and go" test was measured as the time taken for each subject to rise up from a chair, walk a distance of 3 metres, return to the chair and sit down (Skelton &

McLaughlin, 1996).

After due consultation with all the members of the Belhar Organisation for the Aged, the volunteers in the exercise group (n=18) took part in an exercise program three days a week (Tuesday, Wednesday and Thursday) over a period of six weeks. One day in the week (Monday) was for health education programs for all members of the organisation, after which each volunteer was re-assessed. The health education programs focussed on the benefits of healthy lifestyle behaviours. The members of the project reserved each Friday for religious activities only. All the participants in the study were advised of their rights to refrain from taking part in the study.

EXERCISE PROTOCOL

Each exercise session lasted for one hour. It started with warm-up exercises for 10 minutes, made up of breathing and stretching exercises. This was followed by a session of low/moderate intensity exercises for 40 minutes. The exercises took place in four smaller groups under the supervision of research assistants, and included dancing to local music selected by the participants,

TABLE I: EFFECT OF EXERCISE PROGRAM ON PARTICIPANTS (n=18)

	Pre-Exercise mean(sd)	Post-Exercise mean(sd)
Anthropometric parameters:		
Body Weight (kg)	70.1(17.0)	69.7(16.7)
Body Mass Index (kgm-2)	30.1(6.2)	29.9(6.1)
Cardiovascular parameters:		
Resting Systolic Blood Pressure (mmHg)	140.1(15.7)	127.4(8.7)*
Resting Diastolic Blood Pressure (mmHg)	86.3(9.0)	80.3(8.7)*
Resting Radial Pulse Rate (bpm)	81.9(8.1)	80.8(7.9)
Functional tasks:		
Chair Rise (sec)	63.0(15.0)	38.0(16.0)*
Timed Up and Go Test (sec)	48.2(7.6)	42.7(7.5)*
Maximum Hand Grip (kg) (Dominant hand)	17.6(7.4)	22.0(8.5)*

*statistically significant difference (p<0.05)

or walking within the neighbourhood when the weather permitted (for 25 minutes). This was followed by 15 minutes of activities like throwing and catching a ball, and bouncing a ball. The routine for each session was planned with the participants. Each participant was allowed to carry out the activities at his/her level of exercise tolerance. Each exercise session ended with a cooling-down period for 10 minutes.

At the end of six weeks, the participants were allowed to evaluate the benefit of the whole program in group discussions. In addition, the parameters which were regularly monitored were analysed by employing descriptive statistics involving mean and standard deviation. For the paired data (pre and post tests) in the exercise group, the paired student's t-test was used for testing significance in respect of all the dependent variables. The level of significance was set at $p < 0.05$ on the rationale that there is little or no chance of a disastrous outcome if there is really no significant difference between the pre- and post-exercise measures (Currier, 1984).

RESULTS

At the onset of this study, reported lifestyle habits of the 18 participants in the exercise group revealed a sedentary type. Eight of the participants (6 males and 2 females) smoked cigarettes and drank alcoholic beverages regularly. All the participants completed the program.

There were no significant changes in body weight and body mass index at the end of the program (Table I). The mean values of the resting systolic and diastolic blood pressures decreased significantly ($p < 0.05$) by 9.1%, and 7% respectively. The average time taken to complete the chair rise test and the up and go test also decreased significantly ($p < 0.05$) by almost 40% and 11% respectively. The average of the maximum handgrip measure of the

dominant hand increased significantly ($p < 0.05$) by 25%.

During the group discussions to evaluate the benefit of the program, participants in the exercise group ($n=18$) reported that they felt healthier and expressed a desire to continue with the physical activity program. They also reported an increase in leisure activities and better sleep status. Members of the organisation who did not take part in the exercise program reported that, based on the knowledge gained during the health education programs, they would love to take part in a future exercise program.

DISCUSSION

A main objective of the policy on the prevention of physical inactivity in older persons at primary level is to encourage older persons to take part in organised physical activities. This study assessed the effects of a program of physical activities on some cardiovascular parameters of volunteers from the Belhar Organisation for the Aged. The study also assessed the time taken by the volunteers to complete some selected functional tasks.

Those who took part in the exercise program were identified by their view on whether they thought that exercise was beneficial to their health or not. The perception of individuals certified medically fit to take part in the study was similar to reported perceived barriers to and benefits of physical activity in older persons (O'niel and Reid, 1991). No effort was made to correct the negative perceptions before the commencement of the study, although the issues were addressed during the weekly health promotion programs.

Repeated exercises involving the practice of functional tasks and mobility have been reported to be beneficial in the maintenance of function and independence in older persons (Skelton et al, 1994; Skelton & McLaughlin, 1996). A similar finding is reported in the current

study in which a six-week low/moderate intensity exercise program resulted in reduced time in the performance of the chair rise test and the "up and go" test, as well as improvement in some cardiovascular parameters and hand grip strength.

The objective evaluation of the functional status of the heart in older persons is not only desirable but necessary. Measurements of heart rate and blood pressure at rest or immediately after activity are used clinically to assess cardiovascular function (Kispert, 1987). The systolic pressure provides an estimate of the work of the heart and of the strain against the arterial walls during ventricular contraction. Diastole pressure provides an indication of peripheral resistance or of the ease that blood flows from the arterioles into the capillaries. The changes in systolic and diastolic blood pressures in the exercise group imply a decrease in the stress or demands placed on the heart.

Functional tasks are vital for maintenance of an independent life. Handgrip is functionally important (Amosun et al, 1995) as it is potentially limiting in tasks like using tools, opening containers, holding on to handrails. The chair rise test and the "up and go" test highlight the functional importance of the lower extremities, as they are dependent on muscle strength, joint function and balance (Skelton et al, 1995; Skelton and McLaughling, 1996). The improvements in the time taken to perform these functional tasks suggest that the proficiency of the participants in carrying out activities of daily living would improve. This tallies with one of the major objectives of the proposed policy which states "The most important point to convey to older people (in the community) is that exercise can make it easier to complete activities of daily living with less fatigue".

A factor which likely contributed to the improvements shown in this

study was the level of interest in each subject. This was apparent from their expressed desire to continue with the exercise program. Exercise has been associated with an improvement in self confidence, sense of well-being, and mental relaxation (O'neil and Reid, 1991). The implication of integrating exercise into one's lifestyle, regardless of age at which one begins, promotes overall health benefits. Improvements in the participants' feelings of physical and mental well-being likely served as a reinforcing feedback which in turn provided an impetus for continuing the program.

It is important to highlight certain limitations relating to methodology in this study. It was impossible to control the involvement of all participants in additional physical activities outside the day care centre. Therefore the confounding effects of the additional activities on the results could not be determined. Another limitation was the time frame of six weeks within which the study was carried out. Although statistically and clinically significant improvements were reported, a longer time frame of three months would be desirable. This may have greater influence on the participants

to modify their sedentary lifestyle behaviours.

CONCLUSION

The outcome of this study supports the objectives of the policy on the prevention of physical inactivity in older persons at primary level. Partaking in organised physical activities, as a deterrent to physical inactivity, is beneficial to the general well-being of older persons in the community. The findings of this study give credence to the proposed policy guidelines on the prevention of physical inactivity in older persons at primary level. However, research efforts should be focussed on overcoming formidable methodological problems in evaluating the effects of an exercise intervention in the community.

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