Prescribed Exercise: A Prospective Study of Health-Related Quality of Life and Physical Fitness Among Participants in an Officially Sponsored Municipal Physical Training Program

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Background: Participants who completed a 3-month prescribed individualized exercise program in groups were followed-up prospectively. The aims were to describe the characteristics of the participants, their health-related quality of life (HRQoL) and physical fitness at baseline, at completion and at 12-month follow-up, and to identify predictors of HRQoL and physical fitness at completion and at 12-month follow-up. Methods: A 1-group follow-up design was used. Data were collected from records of 163 attendees at a municipality-sponsored health center in Norway. HRQoL was measured by self-report using the COOP/WONCA questionnaire. Physical fitness was estimated from the results of a 2-km walk test. Results: Of the 163 participants referred to the clinic, 130 (79.8%) were women and 33 (20.2%) men. Participants who completed were older than those who dropped out. The participants showed clinical improvement in physical fitness and all health-related quality life domains (d > 0.53) at the completion of the program and in physical functioning, mental health, performance of daily activities, overall health, and perceived improved health after 12 months (d > 0.36). Conclusions: Participation in group-based prescribed exercise program for 3 months may improve physical fitness and HRQoL significantly in short and long terms.

Keywords: health promotion, exercise therapy, health behavior

Everyday life of people in the western world is increasingly characterized by inactivity. Inactivity contributes to obesity and increased risk for a variety of serious diseases. Regular physical activity thus plays a key role in people’s health. There is an emerging body of evidence indicating that physical activity prevents the development of several chronic diseases and is beneficial to people including those with heart disease, stroke, type II diabetes, colon and breast cancer.

The World Health Organization recommends at least 30 minutes of regular physical activity with at least moderate intensity most days of the week for adults and healthy elderly. The greatest health benefits are for those who initially are in the worst physical shape. In 2003, the health authorities in Norway introduced a system which gave primary physicians the authority to prescribe exercise for their patients. The prescription was for advice and guidance to changing lifestyle which included starting regular physical exercising for sedentary people and those at risk of developing diseases that are consequences of an unhealthy lifestyle.

There is a paucity of findings in the literature regarding the effects of prescribed physical activity on health-related quality of life (HRQoL). Findings from 3 studies suggested that prescribed exercise can be cost effective. A systematic review of prescribed exercise in general practice showed that 3 randomized controlled trials found positive effects of prescribed exercise on fitness. However, the interventions in these studies were diverse and consisted of motivational interviewing, advising, counseling, and telephone support, and did not implement a professionally led exercise program.

Fysioteket Health Centre in the city of Drammen, Norway was established in 2005, first as a collaborative project between Drammen Municipality, Buskerud County and different local athlete organizations. After 3 years, it became a part of the standard primary health care offered by Drammen Municipality. Drammen Municipality is located in Southern Norway with approximately 63,000 inhabitants who all have a primary physician. Physicians and other health care professionals in the municipality can refer people to Fysioteket Health Centre for programs in physical activity when they determine that it is medically safe for individuals to participate in...
physical activity programs and participation in a physical activity program would improve their health. For some individuals, this is a part of a rehabilitation process, while for others it is basically to prevent diseases or to improve life with a chronic disease.

Aims

1. To describe the characteristics of the participants who completed the prescribed exercise program.
2. To describe the participants’ HRQoL and physical fitness at baseline, at completion of the program, and at 12-month follow-up.
3. To identify predictive factors at baseline associated with HRQoL and physical fitness at 12-month follow-up.

Methods

Participants

The study was designed as a prospective 1-group follow-up study without a control group initiated by the Director of the Department of Physiotherapy in Drammen Municipality as a clinical audit. Thus, all individuals that contacted the Health Centre “Fysioteket” in Drammen with a prescription for exercise from a physician during the period from January 2007 to June 2008 were enrolled in the study.

The Exercise Program

The training was a 3-month program free of charge led by a physiotherapist. The physiotherapists focused on participants’ resources and possibility for changing lifestyle as opposed to focusing on the disease and barriers to change. The participants had 1 physical test in the beginning of the program and another test at the end as the routine procedures. During the 3-month program the participants met for training in groups twice a week. Each work-out took place primarily outdoors and lasted 90 minutes. Each work-out started with warm-up, followed by cardio training, strength training, and ended with relaxation and stretching. The main activity was a relatively fast walk in a hilly terrain adapted to each participant’s physical condition.

Consultations

Each participant also had an individually structured counseling session at the beginning and at the conclusion of the program. The 2 sessions of counseling were structured in the same way focusing on behavioral change based on the method of change-focused counseling described by Prescott and colleagues. At the first counseling session the participants described their personal goals and their motivation for changing unhealthy life habits, and developed personal plans for changing their current behaviors. At the second counseling session the participants evaluated their stated goals and motivation identified at the beginning, reviewed the results from the physical tests, and described their goals and motivation for healthier lifestyle in the near future.

Sampling

There was no specific sampling procedure used in this study, as all individuals referred to the Centre’s program were the participants of the study. A total of 163 individuals out of 169 referrals completed the study and served as the study’s database.

Measurements

Demographics. Data on the participants’ age (years), gender, and highest level of education (7–10 years, 11–12 years, 13 years, ≥14 years) were registered.

HRQoL. HRQoL was measured by the Dartmouth Primary Care Cooperative Information Project/ World Organization of National Colleges, Academies, and Academic Associations of General practice/Family Physicians (COOP/WONCA) questionnaire. The instrument was developed to screen peoples’ health related quality of life for use in general practice. The decision to use COOP/WONCA was made by the Centre when they decided on an instrument for clinical audit. The simple form of the instrument makes it suitable for routine application in clinical practice which was the major reason for selecting this instrument. The COOP/WONCA consists of 5 single-item domains; physical functioning, mental health, daily activities, social activities and overall health. Respondents are requested to score each domain on a 5-level ordinal scale. Lower scores represent good health. In addition to the 5 items it also measures perceived change in health during the last 2 weeks. This item is also scored on a 5-level scale, in which level 3 represents no change, the scores 1 and 2 are for different levels of improvement and the scores 4 and 5 are for levels of worsening in health. The instrument has been translated into Norwegian and shown to have satisfactory reliability and validity.

Physical Status. The participants’ body mass index (BMI) was calculated based on the usual method of calculation using weight and height.

Physical fitness was estimated based on the participants’ performance in a 2-km walk test developed at the Finish UKK institute. The test has been developed and considered feasible and accurate for determining the cardiorespiratory fitness of healthy adults. The walking test has shown satisfactory reliability and validity in relation to healthy nonathletic adults and older adults. Estimation of the maximal oxygen consumption (VO2max) was calculated from the walk test using gender-specific equations including age, BMI, performance time for the walk and heart rate (HR) immediately after the walk finish.
Procedures

The COOP/WONCA questionnaire was filled out during the consultations at the baseline and at the conclusion of the 3-month program, and the completed forms were stored in the participant’s clinical record. Twelve months after completing the program, each participant was mailed the same questionnaire for completion, requesting its return in a prepaid return envelope. Participants were measured for weight (with light clothing and without shoes) and height at the center at the time the walk tests were conducted. The 2-km walk test at the baseline and at the completion of the program was led by a physiotherapist trained for the specific walking test. The walk tests were carried out on marked outdoor courts in an official sports arena located next to the center.

Statistical Analysis

The data were analyzed using SPSS for Windows Version 17.0 software (SPSS Inc., IL, USA). T-tests for independent and paired samples were used to analyze continuous variables. Categorical data were analyzed using chi-square and Fisher’s Exact Test when any of the cells had less than expected 5 responses. The level of significance was set at $P < .05$, and all tests were 2-tailed. Effect sizes (ES; ie, Cohen’s coefficient $d$ and the related 95% CI) were calculated to estimate the effect size. A $d$ value $\geq 0.40$ was considered clinically significant. Cohen’s coefficient $d$ is a standardized measure of effect size, representing the difference between the means divided by the pooled SD. Bivariate analysis (Pearson’s $r$) and linear regression analysis were used to identify baseline predictors for the participants’ level of physical fitness and overall health after 3 and 12 months. Age and sex were entered in the first block, BMI in the second block, the COOP/WONCA scores in the third block (ie, physical functioning, mental health, daily activities, and social activity), and physical fitness in the fourth block.

Ethical Issues

The study was a clinical audit initiated and approved by the Head of the physiotherapist service in the municipality. The data available for this study did not contain any information that could identify particular individuals. The Regional Medical Research Ethics Committee of Health East of Norway evaluated the study as a clinical audit and thus issued a Letter of exemption from ethics approval.

Results

Study Population

At baseline, 163 individuals filled out the COOP/WONCA questionnaire when they were at the health center for the first time. Their mean age was 47.6 years (SD = 11.7) and the age ranged from 20 to 70 years ($n = 159$). Eighty percent were females ($n = 130$), and 20% were males ($n = 33$).
Characteristics of the Completers and the Dropouts

There were dropouts from the program and data collection as shown in the flowchart (Figure 1). Of the participants who completed the COOP/WONCA at baseline, 78 participants (47.9%) completed the exercise program. Among these, 74 (94.9%) also completed the walk test at baseline. Fifty-seven of the completers (73.1%) filled out the COOP/WONCA questionnaire at the 12-month follow-up. Only 4 returned for the walking test after 12 months. Of the dropouts who completed the baseline data (n = 85), only 50 persons (58.8%) had valid data on the walk test taken at baseline. The sociodemographic characteristics of participants who completed the program, those who dropped out, and those who responded at the 12 months follow-up are shown in Table 1.

Participants who completed the program were older than those who did not complete (d = 0.35). There was no difference with regard to the proportion of men and women or level of formal education between the completers and the dropouts. There was no significant difference between these 2 groups (the completers and the dropouts) with regards to the baseline data on body weight, BMI, physical fitness (Table 1), or any of the COOP/WONCA scores (data not shown). However, the participants who completed had a somewhat higher mean physical fitness score at baseline than those who dropped out of the program (d = 0.24; ie, clinically not significant).

Results for the Completers

Changes in Quality of Life and Physical Fitness. The COOP/WONCA scores improved at the conclusion of the program significantly from the baseline scores (See Table 2). A significant change indicating an improvement was also evident in the perceived change in health. In addition, the weight change and the change in the physical fitness scores were significant, indicating positive changes. However, although the mean BMI score was lower at the conclusion of the program, the difference was not statistically significant.

Data from the subsample of 57 with valid scores on the COOP/WONCA scores at the 12-month follow-up showed clinically significant improvements on all COOP/WONCA domains compared with the scores at the baseline. The participants also perceived a positive change in health between the baseline and the 12-month follow-up.

Predictive Factors for Physical Fitness. When we analyzed the sociodemographic variables, BMI, and the COOP/WONCA scores and their bivariate relations to physical fitness after completing the program, women, participants with lower BMI, and those with less problems related to performing daily activities had better physical fitness than men, participants with higher BMI and those reporting more problems related to performing daily activities. The participants’ sex, BMI, and the performance of daily activity domain of the COOP/WONCA at baseline were significantly correlated with their physical fitness scores at the completion of the program.

The linear regression showed that being female, having lower baseline BMI, and having fewer baseline problems related to daily and social activities (2 domains of the COOP/WONCA) predicted higher scores on physical fitness at the completion of the program. The regression model explained 42.4% of the variance in physical fitness at the completion of the program. When this regression analysis was repeated and the relationships were controlled for the participants’ physical fitness at baseline, higher scores on physical functioning (ie, reported less physical functioning; β = 0.13, P = .03) and lower scores on daily activities (ie, less problems related to performing daily activities; β = −0.18, P = .008) at baseline predicted higher physical fitness at completion of the program.

Predictive Factors for the Participants Overall Health. The bivariate analysis showed that age and 4 of the COOP/WONCA domains (mental health, performing daily activities, social functioning and overall health) were positively associated with the overall health at the completion of the exercise program (Table 3). The linear regression analysis showed that the domain of performing daily activities in the COOP/WONCA was the only variable significantly explaining the overall health at the completion of the program, although the total variance explained by the COOP/WONCA domains together was 26.4%. In a similar regression analysis where we also controlled for overall health at baseline lower scores on performing daily activities (ie, less problems related to performing daily activities; β = 0.33, P = .02) at baseline was the only variable that predicted lower scores on general health (ie, better health) at completion of the program.

The bivariate analyses showed that BMI scores were negatively associated with the overall health at 12-month follow-up while 4 of the COOP/WONCA domains (physical functioning, mental health, social functioning, and overall health) at the baseline were related positively with the overall health at the 12-month follow-up. The linear regression analysis showed that BMI and 2 of the COOP/WONCA domain scores (physical functioning and performing social activities) at baseline explained the overall health at the 12-month follow-up significantly, with the BMI scores explaining 16.0% of the variance and the COOP/WONCA domain scores explaining 16.3% of the variance in the overall health scores at the 12-month follow-up.

Discussion

Our study showed that those who attended the prescribed exercise program showed clinically significant improvement in all of the COOP/WONCA domains and physical fitness at the completion of the program. We also found clinically significant long term improvements in the HRQoL associated with physical functioning, mental health, performance of daily activity, and overall health at the 12-month follow-up. Our findings are similar
Table 1  Characteristics of the Individuals Who Filled Out the COOP/WONCA Questionnaire at Baseline, After Completing the Program and at the 12 months Follow-Up

<table>
<thead>
<tr>
<th>Baseline variables</th>
<th>All participants who enrolled in the program (Group A) N = 163</th>
<th>Participants who completed the program (Group B) N = 78</th>
<th>Drop-outs from the program (Group C) N = 85</th>
<th>Participants who completed the program &amp; 12 month follow-up (Group D) N = 57</th>
<th>Completers who dropped out from the follow-up (Group E) N = 21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographic variables</td>
<td></td>
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</tr>
<tr>
<td>Age, mean (SD)</td>
<td>47.6 (11.7) n = 159</td>
<td>49.5 (10.2)</td>
<td>45.4 (13.1)a n = 81</td>
<td>50.4 (9.6)b</td>
<td>46.9 (11.3)</td>
</tr>
<tr>
<td>Sex, n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>33 (20.2)</td>
<td>14 (17.9)</td>
<td>19 (22.4)</td>
<td>10 (17.9)</td>
<td>4 (21.1)</td>
</tr>
<tr>
<td>Women</td>
<td>130 (79.8)</td>
<td>64 (82.1)</td>
<td>66 (77.6)</td>
<td>46 (82.1)</td>
<td>15 (78.9)</td>
</tr>
<tr>
<td>Level of education, n (%)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7–10 years</td>
<td>40 (24.5)</td>
<td>23 (29.5)</td>
<td>17 (20.0)</td>
<td>16 (28.1)</td>
<td>7 (33.3)</td>
</tr>
<tr>
<td>11–12 years</td>
<td>68 (41.7)</td>
<td>29 (37.2)</td>
<td>39 (45.9)</td>
<td>22 (38.6)</td>
<td>7 (33.3)</td>
</tr>
<tr>
<td>13 years</td>
<td>20 (12.3)</td>
<td>8 (10.3)</td>
<td>12 (14.1)</td>
<td>6 (10.5)</td>
<td>2 (9.53)</td>
</tr>
<tr>
<td>≥14 years</td>
<td>35 (21.5)</td>
<td>18 (23.1)</td>
<td>17 (20.0)</td>
<td>13 (22.8)</td>
<td>5 (23.8)</td>
</tr>
<tr>
<td>Physical status, mean (SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>87.9 (20.4)</td>
<td>88.0 (20.3)</td>
<td>87.9 (20.7)</td>
<td>84.8 (19.9)c</td>
<td>96.5 (19.2)d</td>
</tr>
<tr>
<td>n = 127</td>
<td>n = 74</td>
<td>n = 53</td>
<td>n = 54</td>
<td>N = 20</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>31.4 (7.4)</td>
<td>32.1 (7.8)</td>
<td>30.4 (6.7)</td>
<td>31.0 (8.0)</td>
<td>35.1 (6.8)</td>
</tr>
<tr>
<td>n = 127</td>
<td>n = 74</td>
<td>n = 53</td>
<td>n = 54</td>
<td>N = 20</td>
<td></td>
</tr>
<tr>
<td>2-km walking test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical fitness</td>
<td>64.6 (25.8)</td>
<td>65.7 (23.9)</td>
<td>63.0 (28.3)</td>
<td>70.7 (21.5)c</td>
<td>52.2 (25.4)d</td>
</tr>
<tr>
<td>n = 127</td>
<td>n = 74</td>
<td>n = 53</td>
<td>n = 54</td>
<td>N = 20</td>
<td></td>
</tr>
<tr>
<td>VO₂max</td>
<td>20.8 (8.0)</td>
<td>20.1 (7.7)</td>
<td>21.8 (8.5)</td>
<td>21.6 (7.5)c</td>
<td>15.9 (6.8)d</td>
</tr>
<tr>
<td>n = 124</td>
<td>n = 74</td>
<td>n = 50</td>
<td>n = 54</td>
<td>N = 20</td>
<td></td>
</tr>
</tbody>
</table>

Note. Significant differences (P < 0.05): a between (B and C); b (C and D); c (C and E); d (D and E).
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to those reported in previous published intervention studies of prescribed exercise. It has been found that persons increase their level of physical activity at $6^{13,30}$ and 12 months$^{13,15}$ and report improvements in HRQoL after $6^{13,30}$ and 12 months after the intervention started. A Cochrane review$^{31}$ of intervention studies aimed at increasing peoples’ level of physical activity concluded that there is evidence for positive short to midterm effects of interventions on self-reported physical activities. However, there are only a small number of studies that examined long term effects of participation in prescribed exercise programs.$^{31}$ A previous study$^{13}$ in which patients participated in a prescribed exercise program using motivational interviewing by their primary physicians showed improvement in physical functioning up to 12 months after the intervention was initiated. Our study showed clinically significant improvement in HRQoL measured by the COOP/WONCA domains at the completion of the program and at the 12-month follow-up. Therefore, we conclude that a 12-week exercise program guided by a professional, individualized but carried out in groups was effective in improving HRQoL.

Furthermore, our study showed that performing activities regularly was a key factor in predicting both the level of physical fitness and the overall health at the completion of the program. To our knowledge, this finding is new and needs to be investigated further in future studies. One unique aspect of the exercise program in

Table 2  Health-Related Quality of Life (COOP/WONCA) and Physical Status Among the Completers (N = 78) at Baseline and After Completing the Program [Mean, SD, ES (d), and 95% CI for d]

<table>
<thead>
<tr>
<th>The COOP/WONCA domains, n = 78 (lower scores = better health)</th>
<th>Baseline</th>
<th>After completing the program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Physical functioning (1–5)</td>
<td>3.1 (0.7)</td>
<td>2.5 (0.8)</td>
</tr>
<tr>
<td>Mental health (1–5)</td>
<td>3.0 (1.2)</td>
<td>2.3 (1.2)</td>
</tr>
<tr>
<td>Daily activities (1–5)</td>
<td>2.8 (1.1)</td>
<td>2.2 (1.1)</td>
</tr>
<tr>
<td>Social activity (1–5)</td>
<td>2.6 (1.3)</td>
<td>1.8 (1.0)</td>
</tr>
<tr>
<td>Overall health (1–5)</td>
<td>3.3 (0.8)</td>
<td>2.6 (0.8)</td>
</tr>
<tr>
<td>Health transition</td>
<td>2.8 (0.7)</td>
<td>2.3 (0.8)</td>
</tr>
<tr>
<td>Weight, n = 70</td>
<td>87.0 (20.2)</td>
<td>85.9 (19.8)</td>
</tr>
<tr>
<td>BMI, n = 68</td>
<td>31.7 (7.7)</td>
<td>30.5 (6.6)</td>
</tr>
<tr>
<td>Walking test, n = 70</td>
<td>66.3 (23.9)</td>
<td>76.1 (23.1)</td>
</tr>
</tbody>
</table>

$^a$ P-values for the paired sample t test of the variables at baseline and postprogram.

Table 3  Health-Related Quality of Life (COOP/WONCA) Among the Completers at Baseline and 12-Month Follow Up, N = 57 [Mean, SD, t, P, and ES (Cohen’s d) and 95% CI for d]

<table>
<thead>
<tr>
<th>The COOP/WONCA domains (lower scores = better health)</th>
<th>Baseline</th>
<th>After 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Physical functioning (1–5)</td>
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</tr>
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<td>Social activity (1–5)</td>
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<td>1.8 (1.0)</td>
</tr>
<tr>
<td>Overall health (1–5)</td>
<td>3.3 (0.8)</td>
<td>2.5 (0.9)</td>
</tr>
<tr>
<td>Health transition</td>
<td>2.8 (0.7)</td>
<td>2.4 (0.8)</td>
</tr>
</tbody>
</table>

$^a$ P-values for the paired sample t test of the variables at baseline and postprogram.
this study was including 2 counseling sessions with a physiotherapist at the beginning and at the completion of the program. Individualized counseling and consultations with persons during and after exercise programs regarding their performance may benefit both the outcomes and motivation to continue to participate in exercise programs.

BMI is another predictive factor for physical fitness at the completion of the program and for overall health at the 12-month follow-up. This finding is in line with a previous finding that obesity is negatively associated with quality of life. In our study the dropout rates were higher among younger participants that received prescribed exercise intervention than those with higher age.

Except for younger people more often dropping out of the exercise program, the characteristics of the dropouts were not related to other sociodemographic variables or physical status including BMI at admission. While the females were over-represented in the completers, they were similarly over-represented in the total referrals, suggesting either that females in general are more likely to require programs of physical exercise or that there is an over-representation of females seeking general health care from primary care physicians. The only significant difference between the completers and the dropouts of our study was age. More of the younger referrals had dropped out of the program. A possible explanation for dropouts by younger individuals may be that walking is too boring an activity and/or they may not like to exercise together with people that are older than themselves. A further investigation regarding what sorts of physical activities people who drop out of regimented exercise programs pursue would be enlightening to examine the effects of motivation, readiness for change, and contextual influences. A recent published review also reported that little is known about the characteristics of those who drop out and their reasons for dropping out. The explanation for why so many dropped out of exercise programs in some of the studies can be explained by the routine protocols used in the designs that did not include follow-up calls or contacts by professionals when participants dropped out of the programs. There is evidence that interventions that used telephone follow-up calls had far lower drop-out rates. A more rigorous study of the impact of telephone follow-up in preventing dropouts would be needed.

Strengths and Weaknesses

This study is based on analyses of the data registered prospectively in a clinical setting and obtained by applying various measurement tools that were a part of the standardized consultations. The strength of this approach is that the data collection and implementation of the program was not adjusted to fit a research program. The majority of the completers were also followed up 12 months after they attended the center. On the other hand, the study had a number of weaknesses mainly related to the lack of a control group and random sampling. Furthermore, the follow-up group should be thought of as a self-selected group, in which individuals with a healthier life style or high motivation would have been more likely to be included. The participants’ medical reasons for receiving the prescription from their primary physicians were not known to the health care workers at the health center. Therefore, it was not possible to examine the effects of comorbidity both on participation in the program and outcomes. The physiotherapist’s enthusiasm in leading the program might have influenced the participation in the program as well as on the participants, thereby affecting the outcomes especially in the COOP/WONCA questionnaire at the completion of the program. However, it is not reasonable to believe that this effect explains the results in the 12-month follow-up data. Since the 2-km walk test is not the gold standard for measuring physical fitness, the study has to be replicated to validate our findings of the participants’ sustained improvement in physical fitness. Recent studies of the validity and reliability of the COOP/WONCA have shown good internal and discriminative validity, internal consistency and test-retest reliability. The reason for the high proportion of missing data on physical fitness among those who dropped out of the program is that several people only met at the clinic for the first consultation with the physiotherapist.

Conclusions

Participants in a 3-month professional guided exercise program may experience a sustained, clinically significant increase in their health related quality of life for up to 12 months. Furthermore, their physical fitness may improve significantly during the program. It is important to be aware of the tendency for younger people to drop out of exercise programs. The intervention has a potential to be considered as a primary strategy for addressing inactivity in adults.

References