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ORIGINAL RESEARCH PAPER

ORIGINAL RESEARCH: CLINICAL

Older adults' evaluations of the standard and modified pedometer-based Green Prescription

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ABSTRACT

INTRODUCTION: The Green Prescription is a primary care programme designed to increase physical activity in individuals with low activity levels. Older adults tend to engage in insufficient physical activity to obtain health-related gain.

AIM: To examine participants' ratings of the Healthy Steps intervention and to assess how participants rated the use of a pedometer-based Green Prescription in aiding their physical activity.

METHODS: In total, 330 community-dwelling older adults who have low levels of activity were randomised to receive either a standard time-based Green Prescription or a modified pedometer-based Green Prescription. Post-intervention, 259 participants completed the participant evaluation questionnaire via postal survey. Data were analysed using descriptive statistics and Chi-squared analyses.

RESULTS: The standard components of the Green Prescription (general practitioner consultations and telephone counselling) received similar and higher ratings across both allocation groups than the use of print materials. A pedometer-based Green Prescription was rated as being helpful in aiding physical activity.

DISCUSSION: This study supports the importance of general practitioners' initial role in prescribing physical activity for older adults and of ongoing telephone support for longer-term adherence. Incorporating a pedometer can be effective in helping low-active older adults initiate and maintain regular physical activity.

KEYWORDS: Green Prescription; older adults; physical activity pedometers; participant ratings

Introduction

Regular physical activity provides physical, psychological and cognitive health-related benefits throughout the lifespan.[1,2] Despite such benefits, most New Zealanders aged ≥65 years do not meet national physical activity guidelines.[3]

The Green Prescription (GRx) was developed in New Zealand as a primary care programme to help

WHAT THIS GAP FILLS

What is already known: General practitioners' prescriptions for physical activity are well received by older adults. Regular telephone-based support can aid physical activity engagement in older adults.

What this study adds: A pedometer-based Green Prescription can be a feasible and acceptable way of helping aid physical activity in low-active older adults.

increase physical activity.[4] General practitioners (GPs) and practice nurses prescribe physical activity based on national guidelines via a prescription, in the same format that pharmaceutical medication is prescribed.[4] A GRx is mainly given to patients with pre-existing stable chronic health conditions, combined with excess weight and low activity levels.[5] Each GRx runs for a 3-month period and is accompanied by monthly telephone-based support for physical activity from a patient support counsellor.[5]

The present study was designed to examine participants' ratings of the Healthy Steps study, a randomised controlled trial testing interventions designed to increase physical activity in 330 low-active, community-dwelling older adults.[6] Participants in the Healthy Steps study were randomised to receive either the standard time-based or a modified pedometer-based GRx.[6] The Healthy Steps study was successful in increasing physical activity. Participants in both study groups experienced significant increase in physical activity that was still evident at the 12-month follow up.[6]

Previous GRx research, including the Healthy Steps study,[6–8] has mainly focused on outcome measures (quantifying physical activity and health-related gain, evaluating economic feasibility), with limited focus on participants' evaluations by subjective feedback of their experiences of involvement in the programme.

Therefore, we evaluated participants' experiences of the intervention components that comprise the Healthy Steps study. This specifically involves evaluating how both the standard GRx components were delivered as well as the modified GRx, where pedometers were added to aid physical activity. Participant feedback helps to identify the components of both versions of the GRx that were perceived to be more and less helpful in aiding physical activity.

Several studies have demonstrated that pedometers can help increase physical activity in previously low-active older adults.[9–11] Therefore, a pedometer-based GRx may be more effective in helping low-active older adults initiate and maintain regular physical activity than the standard time-based GRx.

The present study may provide a rationale for using a pedometer-based GRx for low-active older adults. Therefore, the purpose of the present study is two-fold: first, to investigate whether participants' ratings of the standard components of the GRx (GP involvement, telephone counselling, use of print materials) differed from ratings of the time-based or the pedometer-based GRx; and second, to examine how participants rated the use of the components of a pedometer-based GRx in aiding their physical activity. The present study comprised the main findings from a portion of the first author's doctoral thesis.[12] The thesis overall examined older adults' perceived motives, benefits and barriers for physical activity through the GRx programme.[12]

Methods

Participants

All 330 participants from the Healthy Steps study[6] were invited to take part in the present research on completion of the Healthy Steps intervention (3-months post baseline). Of the overall sample, 259 took part in the evaluation process (response rate = 78%). The respondents comprised 130 from the time-based group and 129 from the pedometer-based group. Sixty percent of participants in the present study were female. Recruitment criteria for the Healthy Steps study is described elsewhere.[6] Briefly, to be eligible to participate in the Healthy Steps study, potential participants had to be aged ≥65 years, community-dwelling in the Auckland region, classified as low-active (engaging in <150 min of physical activity per week) and not have health conditions that could restrict physical activity.

The Healthy Steps Study

The first part of the GP consultation for the GRx was delivered in exactly the same format for both study groups, with GPs writing a GRx and explaining how to carry it out. Based on random allocation, each participant received either a time-based or pedometer-based GRx from their GP. Participants in the pedometer-based group were given a pedometer with their GRx, accompanied by a Pedometer Information Booklet and a Walking Log for Pedometer Step Counts booklet.[6] During the 3-month intervention phase, each participant received three phone calls (one per month) from the patient support counsellor. Telephone counselling was based on the transtheoretical model of behaviour change.[13] Phone calls were designed to provide ongoing external support and advice for physical activity, and to monitor patient safety. The content of the phone calls differed based on study group.

Time-based Green Prescription

Telephone-based counselling for participants in this group focused on time-related goals for physical activity. Participants were instructed to engage in their prescribed activity for a set period of time each day (e.g. a daily 30-min session of walking).

Pedometer-based Green Prescription

Telephone-based counselling for participants in this group focused on pedometer step-related goals. Participants were asked to accumulate steps that could be monitored by their pedometer through their prescribed activity, including everyday activities (e.g. using stairs instead of an elevator). Participants kept a daily log of their step-counts.

Print materials

During the first month of the intervention period, participants in both groups received four pamphlets addressing physical activity via mail from their patient support counsellor. All print materials were designed specifically for the Healthy Steps study to supplement the telephone counselling. Pamphlets provided information on healthy weight, stretching, medical conditions and physical activity, and water activities.

Measures

At the end of the Healthy Steps trial, participants completed the Participation Satisfaction Survey which was designed to obtain participants' subjective evaluations of their Healthy Steps intervention. Questions in the survey were adapted from the participant evaluation questionnaire used for the TeleWalk intervention, an earlier telephone-based intervention designed to increase physical activity in low-active older adults.[14] The pedometer evaluation questions were adapted from a survey carried out for the 10 000 Steps Rockhampton study, aimed at increasing physical activity via pedometer use.[15]

The Healthy Steps Green Prescription Participant Satisfaction Survey consisted of four sections containing questions relating to the GP consultation for the GRx, the telephone support counselling, the study's print materials, and pedometer use (for the pedometer group only). Responses were recorded on a five-point Likert scale that ranged from 'strongly agree' to 'strongly disagree'. There were two versions of the survey. Participants in the pedometer-based group were given a survey that had nine additional questions related to pedometer use. Aside from the additional pedometer questions, both versions of the survey were identical in content and layout. Table 1 lists the survey questions.

Procedures

On completing their 3-month intervention phase, participants were mailed an information sheet detailing the participant evaluation study and the questionnaire, with a reply-paid envelope to return the completed questionnaire. The information sheet stated that the questionnaire was optional and that no one would be individually identified in any reporting of the survey results. If questionnaires were not returned within 2 weeks, participants were followed up with a phone call. Written informed consent was obtained from each participant. Ethics approval for the present study was obtained from Auckland University of Technology's Ethics Committee.

Data analysis

Data were analysed with SPSS (SPSS Inc., Chicago, IL, USA). Descriptive statistics are reported for the

Table 1. Participants' evaluation of the Healthy Steps intervention components

	Time-based participants				Pedometer-based participants				Difference between study groups (χ^2 test)
	Agree and strongly agree *n* (%)	Not sure *n* (%)	Disagree and strongly disagree *n* (%)	Did not recall or did not receive *n* (%)	Agree and strongly agree *n* (%)	Not sure *n* (%)	Disagree and strongly disagree *n* (%)	Did not recall or did not receive *n* (%)	
GP consultation for Green Prescription (GRx)									
The appointment with my doctor or nurse for the GRx was a positive experience	104 (80)	12 (9)	6 (5)	8 (6)	112 (87)	6 (5)	5 (4)	6 (4)	$\chi^2 = 3.1$ $P = 0.68$
I felt that my doctor or nurse discussed the best type of physical activity for me	103 (79)	13 (11)	6 (4)	8 (6)	98 (76)	9 (7)	14 (11)	8 (6)	$\chi^2 = 1.7$ $P = 0.88$
Telephone counselling									
The phone support motivated me to be physically active	98 (76)	16 (12)	15 (11)	1 (1)	87 (68)	26 (20)	12 (10)	4 (2)	$\chi^2 = 5.4$ $P = 0.68$
The advice I was given was helpful and relevant to me	104 (80)	16 (12)	8 (6)	2 (2)	103 (79)	14 (11)	11(9)	1 (1)	$\chi^2 = 1.7$ $P = 0.89$
The phone support person was supportive and understanding	108 (84)	11 (8)	6 (5)	5 (3)	97 (79)	18 (15)	10 (4)	4 (2)	$\chi^2 = 5.3$ $P = 0.38$
A good overall level of service and support was provided	106 (82)	12 (9)	12 (9)	0 (0)	103 (82)	13 (9)	13 (9)	0 (0)	$\chi^2 = 2.3$ $P = 0.80$
Print materials*									
Walking Log for pedometer step counts	NA	NA	NA	NA	104 (81)	15 (12)	10 (7)	0 (0)	NA
Pedometer information booklet					101 (79)	20 (15)	8 (6)	0 (0)	NA
Healthy Weight Healthy Life pamphlet	76 (59)	29 (22)	14 (11)	11 (8)	76 (60)	30 (23)	7 (5)	16 (12)	$\chi^2 = 3.1$ $P = 0.55$
Stretching pamphlet	77 (60)	33 (25)	10 (7)	10 (8)	83 (65)	32 (25)	8 (6)	6 (4)	$\chi^2 = 6.2$ $P = 0.30$
Medical conditions and physical activity pamphlet	83 (65)	21 (16)	13 (10)	13 (9)	64 (50)	37 (29)	5 (4)	23 (17)	$\chi^2 = 13.8$ $P = 0.008^{\dagger}$
Water activities	52 (40)	47 (35)	22 (18)	9 (7)	44 (33)	62 (49)	10 (8)	13 (10)	$\chi^2 = 16.5$ $P = 0.005^{\dagger}$

* Question asked for each individual pamphlet: "Would you say that this pamphlet encouraged you to become active?".
†Statistically significant result.
NA, not applicable.
Note. Percentage of responses for the main intervention components for the time-based participants. NA, not applicable. Chi-squared analyses provided for both the time-based and pedometer-based groups.

analysis of the participant evaluation questionnaire. Chi-squared analyses were used to test for differences in responses between the two allocation groups for response ratings relating to the GP consultation, telephone counselling and print material components of the two interventions.

Results

Table 1 provides the results of the evaluation for both allocation groups, showing that there were statistically significant differences between study groups only for participants' perceptions of the two pamphlets relating to water activities and medical conditions and physical activity.

GP consultation

Most participants in both study groups agreed or strongly agreed that their appointment with their GP for their GRx was a positive experience, and that their GP discussed the best type of physical activity for them.

Telephone counselling

Most participants in both groups also agreed or strongly agreed that the physical activity advice they received from their patient support counsellor was helpful and relevant, and that the support they received motivated them to become and remain physically active. Likewise, a high percentage of participants in both groups agreed or strongly agreed that their patient support counsellor was supportive and understanding, and that a good standard of service and support was provided.

Print materials

A high percentage of participants in the pedometer-based group agreed or strongly agreed that the Walking Log for Pedometer Step Counts and the Pedometer Information Booklet were helpful in aiding their physical activity. An almost equal percentage of participants in both groups agreed or strongly agreed that the Healthy Weight Healthy Life Pamphlet motivated them to become more active, and that the Stretching Pamphlet was helpful. A significantly higher percentage of participants in the time-based group rated the Medical Conditions and Physical Activity Pamphlet as a more helpful aid in encouraging physical activity than participants in the pedometer-based group ($P = 0.008$). Less than one-half of participants in both groups rated the Water Activities pamphlet as being helpful, but participants in the pedometer-based group rated the Water Activities Pamphlet as significantly less helpful in encouraging physical activity than participants in the time-based group ($P = 0.005$).

Pedometer evaluation

Most participants (88%) in the pedometer-based group agreed or strongly agreed that their pedometer made them aware of how active they were, and 82% indicated that their pedometer motivated them to be more active and to walk more. Most also agreed that their pedometer was comfortable to wear (82%) and 69% agreed that their pedometer could easily be secured to their clothing. However, only a minority (36%) agreed or strongly agreed that their pedometer was accurate in recording all their steps, and that it measured all their activities (39%).

Discussion

This participant evaluation indicated that both versions of the GRx were perceived to be effective in supporting physical activity in low-active older adults. All aspects of the GP consultation for the GRx were rated highly by participants in both groups. Patients both expect and want physical activity advice from their GP.[16,17] Such advice is effective in facilitating physical activity in previously low-active older adults.[18,19] Individuals are more likely to consider and adhere to physical activity advice when it is given by their GP.[20] A qualitative study that examined attitudes towards receiving a GRx found the GP consultation component to have an important influence on how participants viewed physical activity prescription.[20] Participants considered their GP a 'significant other' because of their authoritative knowledge about health promotion, and were more inclined to engage in physical activity because such advice was imparted by their GP.[20]

All aspects of the telephone counselling component were rated highly by participants in both study groups. Participants indicated that the advice they

were given from their patient support counsellor was helpful and relevant. The telephone counselling that participants received during the course of the intervention was underpinned by the transtheoretical model of behaviour change, a model that encompasses a theory of behaviour change that is based on stages and processes of both cognitive and behavioural change in relation to an individual contemplating and adopting a new behaviour, such as engaging in regular physical activity.[13] The telephone-based support that participants received was tailored to meet their individual stage of readiness for physical activity.

Participants in both study groups felt that their patient support counsellor was supportive and understanding. Perceived social support through telephone counselling is a strong factor in encouraging older adults to adhere to physical activity.[18,21] The advice, support and encouragement that individuals receive from their patient support counsellor via telephone counselling has previously been shown to be fundamental in helping them remain active and focused on completing their GRx.[22,23] Telephone counselling can act as an external motive for physical activity,[19] as well as a reminder or prompt to be physically active.[24]

Compared to other intervention components, print materials received overall lower ratings for perceived helpfulness in aiding physical activity, although participant evaluations differed significantly between study groups. Participants in the time-based group rated two pamphlets (Medical Conditions and Physical Activity pamphlet and the Water Activities pamphlet) as more helpful in aiding their physical activity than participants in the pedometer-based group. A possible reason for this difference could be related to the emphasis in these two pamphlets on the importance of regular time-based physical activity for health gain. Also, water-based activities cannot be quantified by a pedometer.

A pedometer-based GRx was perceived by participants to aid their physical activity in the present study; a finding that was substantiated in the main outcomes for the Healthy Steps study.[6] At post-intervention (the 3-month conclusion of their GRx), physical activity across all measured domains had significantly increased in both study groups.[6] These increases in activity were still evident at the 12-month follow-up period (9-months post-intervention).[6] At the 12-month follow-up period, however, there was a significant increase in leisure walking for the pedometer-based group, but not for time-based group.[6] At the conclusion of the intervention period, participants kept their pedometers.

Participants in the pedometer-based group provided positive evaluations for using a pedometer-based GRx. Most participants in this group indicated that their pedometer made them aware of how active they were, and, as a result of this awareness, made them more active, by motivating them to walk more. This finding is consistent with other pedometer-based interventions carried out with both younger- and older-aged adults.[9,25,26]

Participants conveyed that keeping a record of their daily step counts encouraged them to walk more. Step-count feedback can help an individual monitor their progress, work towards setting goals and also help them feel accountable and focused.[26] Compared to other physical activity monitoring devices, pedometers are less complicated to use, they can be less intrusive, and are a more cost-effective tool for supporting physical activity.[11,27,28] Regular pedometer use can have several health-related benefits that are associated with increases in physical activity through the use of pedometer monitoring of step counts.[29] Healthy functioning adults should aim for 10,000 steps per day, as there is evidence that $<$5000 steps per day increases risk for cardiovascular disease and other chronic health conditions.[29]

A strength of this study is that it examined older aged participants' evaluations of an existing nationwide physical activity programme and a modified version that was designed specifically to aid and support physical activity in low-active older adults. A potential limitation is that not all participants completed the participant evaluation; however, we did achieve a 78% response rate.

Conclusions

Participant feedback indicates that GP-endorsed and prescribed physical activity, combined with ongoing telephone-based support and supplementary print materials, with or without the addition of

a pedometer, is perceived to be an effective way of supporting physical activity in low-active older adults. Both versions of the GRx were well received, but a pedometer-based GRx can quantify and monitor everyday habitual physical activity, making continuing activity more sustainable for older adults than the standard time-based GRx of a 30-min session of physical activity. The findings of this study therefore suggest that a pedometer-based GRx can be a valuable health promotion tool in helping low-active older adults initiate and maintain regular physical activity.

Competing interests

The authors declare no competing interests.

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