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Who is not adhering to physical activity referrals, and why?

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Key point:

Many studies focus on adherence to physical activity referrals (PARs) and present data only for those adhering to such prescriptions. The aim of this study is to instead determine who is not adhering to PARs, and why. Reasons for non-adherence differ between groups and the information we have obtained may be valuable for further improving PARs.

Abstract

Objective: To analyse patients' self-reported reasons for not adhering to physical activity referrals (PARs).

Design and setting: Data on 1,358 patients who did not adhere to PARs were collected at 38 primary health care (PHC) centres in Sweden.

Intervention: PHC providers issued formal physical activity prescriptions for home-based activities or referrals for facility-based activities.

Subjects: Ordinary PHC patients whom regular staff believed would benefit from increased physical activity.

Main outcome measure: Reasons for non-adherence to PARs: "sickness", "pain", "low motivation", "no time", "economy" and "other".

Results: Sickness and pain were the most common motives for non-adherence among older patients. The youngest patients blamed economy and lack of time more frequently than those in the oldest age group. Economy was a more common reason for non-adherence among those referred facility-based activities compared to those prescribed home-based activities. Low motivation was a more frequent cause of non-adherence among those prescribed home-based activities compared to those referred facility-based activities. Furthermore, lack of time was a more common reason for non-adherence among patients issued PARs due to high blood pressure than other patients, while low motivation was a more common reason among patients issued PARs because of a BMI of >25.

Conclusion: The reasons for non-adherence differ between patients prescribed home-based activities and referred facility-based activities, as well as between patients with different specific characteristics. The information we have obtained may be valuable not

only for the professionals working in PHC, but also for those who work to develop PARs for use in different contexts.

Key words: Exercise, prescription, lifestyle, primary prevention, health promotion, adherence

Introduction

Written prescriptions of physical activity, in Sweden commonly referred to as physical activity referrals (PARs) (1), have increased in popularity in recent years (1-11). The evaluation of physical activity interventions in health care settings is still a relatively young research field. Studies into the effectiveness of different types of health care-based physical activity interventions have so far reported mixed results (6, 7, 12-14).

The effects of physical activity interventions in health care settings are often evaluated in terms of self-reported physical activity, energy expenditure, quality of life or risk factors such as high blood pressure. Their efficacy has mostly been studied in randomized controlled trials and using researcher-assisted study protocols (6).

In contrast, few studies have evaluated patients' self-reported adherence to physical activity interventions, and there is a paucity of knowledge concerning reasons for non-adherence. Adherence has been defined by the WHO as "the extent to which a person's behaviour - taking medication, following a diet, and/or executing lifestyle changes - corresponds with agreed recommendations from a health care provider" (15). Increased knowledge about those who do not adhere to physical activity interventions and why would help us to define patient groups with different needs and to optimise the use of PARs in order to improve adherence.

The overall aim of this prospective study was to obtain knowledge about non-adherent patients in a regional PAR scheme implemented in routine primary health care (PHC). The first aim was to identify and analyse patients' self-reported reasons for not adhering to PARs. The second aim was to describe and analyse different patient characteristics associated with non-adherence.

Materials and Methods

More detailed descriptions of the methods used, and characteristics of the study population and PHC population in the region, can be found elsewhere (16, 17).

Study setting

The study was conducted at PHC centres in the county of Östergötland, Sweden. Patients were recruited prospectively from 37 of its 42 PHC centres in 2004 and 38 of 42 centres in 2005.

Prescription procedure

All persons eligible to receive PARs were ordinary PHC patients whom regular staff believed would benefit from increased physical activity. They either had a sedentary lifestyle or a diagnosis for which increased physical activity could be beneficial (e.g. high blood pressure, diabetes, or a musculoskeletal disorder).

Each patient was provided with a written PAR and a copy was kept in the patient's medical record. The physical activities prescribed were either home-based (e.g. walking) or facility-based (e.g. group gymnastics, aerobics, water aerobics, weight and circuit training) (1, 5, 18). If the activity prescribed was facility-based, a copy of the referral was sent to a PAR coordinator in a local physical activity organisation, who then contacted the patient by telephone or letter. Patients paid normal entry/membership fees.

Baseline measurements

The prescription form used to collect baseline data contained patient data (e.g. age, sex, address, telephone number) and the prescriber's profession.

Patients were asked to state the number of days in the previous week (7-day recall) during which they performed "a total of at least 30 minutes of physical activity that made you warm, e.g. brisk walking, gardening, heavy housework, cycling and/or swimming". Self-reported physical activity was classified into four groups: (1) regularly active (30 minutes of moderately intense physical activity on 5–7 days); (2) moderately active (3–4 days); (3) somewhat active (1–2 days); and (4) inactive (0 days).

Reasons for receiving PARs were registered on the prescription form through selection of one or more of eight predefined options. These included sedentary lifestyle and six disease-specific options: musculoskeletal disorder, being overweight (BMI >25), diabetes, high blood pressure, high blood cholesterol and mental ill-health. Patients issued prescriptions for more than one reason were categorised as "combination of reasons/diagnoses". Patients issued prescriptions for other reasons were assigned to the category "other PAR reasons".

Patients issued both a prescription for home-based activities and a referral for structured facility-based activities were assigned to a combined category.

Follow-up measurements

A 3-month follow-up was conducted by personnel at 36 PHC centres in 2004 and 38 centres in 2005. Three different methods were used to collect questionnaire data: telephone interviews (74% of patients), postal questionnaires (14%) and questionnaires provided during routine visits (12%).

Self-reported adherence was assessed by the question "Have you adhered to your physical activity prescription?" Respondents selected one of the following three alternatives: (1) "I have adhered to the prescription"; (2) "I have been active but in an

activity other than the one prescribed"; and (3) "I have not followed my prescription". The results were dichotomized as "Adherence" (alternative (1) or (2)) and "Non-adherence" ((3)).

Patients not adhering to PARs where asked to select one of the following as the main reason for their non-adherence: "sickness", "pain", "low motivation", "lack of time", "economy" or "other".

Statistical analyses

In descriptive analyses, differences between proportions were analysed by non-parametric chi-square test.

Univariate and multiple logistic regression analyses were performed in order to identify possible associations between the outcome variable adherence to PARs (0= adherence, 1= non-adherence) and the explaining variables (sex, age, activity level at baseline, referred activity type, referral practitioner occupation, and reason for prescription of physical activity).

Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. Values of $P < 0.05$ were considered statistically significant. All analyses were performed using SPSS (release 15.0).

Results

During the study period 4,867 patients were issued PARs. Of them, 1,358 reported non-adherence at the 3-month follow-up. The mean age of the participants was 54 years (SD 14.2) and 66% were females. Similarly, in all patients receiving PARs in the region

during this period, average age was 54 years and the proportion of females was 66%. Furthermore, registry data showed that more females (55%) than males visited PHC centres, that 26% of the patients were aged 45-62 years and 26% aged 65+ years, and that 56% were seen by a physician during the study period (19).

The results of univariate logistic regression analysis (Table 1) reveal age-related differences in non-adherence, with the two youngest age groups displaying the highest ORs for non-adherence. The ORs for non-adherence were also high in subjects with the lowest activity levels at baseline and in those issued referrals for facility-based activities. Prescription due to diabetes, high blood pressure and "other PAR reasons" was associated with reduced odds of non-adherence. ORs for non-adherence did not differ according to referral practitioner occupation.

In multiple logistic regression analysis (Table 2), activity level at baseline, activity type and reason for prescription remained significant predictors of non-adherence. Non-adherence was more frequent among subjects who were less active at baseline and those issued referrals for facility-based activities.

Of the 1,358 patients who reported non-adherence, 619 responded to the question concerning reasons for non-adherence. Of them, 12 were excluded because they provided an invalid answer (e.g. they selected more than one alternative). Reasons for non-adherence were analysed using data from the remaining 609 patients (45% of the initial total of 1,358). The main reasons for non-adherence differed according to baseline characteristics (Table 3). Significant differences were found in subjects in different age groups, and in those with different activity types and reasons for prescription. Low motivation was a more frequent reason for non-adherence among men, while sickness and pain seemed to be more frequent among women. Sickness and pain were also more

common causes of non-adherence in patients in the oldest age group (>65 years) than in those in the youngest age group (18-29 years). The youngest patients instead blamed economy and lack of time more frequently than those in the oldest age-group. Economy was also a more common reason for non-adherence among those referred facility-based activities compared to those prescribed home-based activities. Low motivation was a common cause among those referred home-based activities. Moreover, reasons for non-adherence differed between diagnoses. Lack of time was a common reason given for non-adherence among patients issued PARs due to high blood pressure, while low motivation was a common reason among patients issued PARs because they were overweight.

Discussion

This study aimed to evaluate self-reported non-adherence to PARs issued in everyday PHC and to identify characteristics associated with non-adherence. Non-adherence rates were relatively low (28%), but were higher among certain groups, notably those who were inactive at baseline or were referred facility-based activities. Similar results were previously obtained in studies focusing on adherence, and the findings of these studies suggest that our PAR scheme is a comparatively successful intervention (1, 17). Still, there is a need to improve adherence and to determine the reasons for non-adherence. Unfortunately, those who were least active at baseline were overrepresented among the non-adherers. This group has the greatest need and would gain more from an increased physical activity level than other groups.

Unsurprisingly, sickness and pain were the most common causes of non-adherence among older patients, while younger patients blamed economy and lack of time. Economy was also a more common reason for non-adherence among those referred facility-based activities compared to those prescribed home-based activities. Another key finding was that low motivation was a more common cause of non-adherence among those prescribed home-based activities compared to those referred facility-based activities, implying that that facility-based activity may be particularly effective in subjects with lower motivation. Moreover, reasons for non-adherence differed between diagnoses: lack of time was a more common cause among patients with high blood pressure, and low motivation a more common cause among patients with a BMI >25. Motivation (or behavioural intention) is a key predictor of behaviour change in most cognitive and social-cognitive behaviour change models (e.g. the Theory of Reasoned Action, Social Cognitive Theory, the Theory of Planned Behaviour, the Transtheoretical Model, the Precaution-Adoption Process Model). In these models, motivation is influenced by factors such as a person's self-efficacy, perceived environmental barriers to performing the behaviour, attitudes toward the behaviour and social support (20-22). Knowledge of factors that impact on motivation and behaviour change can be valuable when trying to foster the development of PAR schemes.

This study has some limitations that should be taken into consideration. As mentioned previously, patients were prospectively recruited by regular staff in routine PHC, implying that these patients may not be representative of the population as a whole. We measured adherence using a very simple question regarding whether or not each patient adhered to the prescribed activity. As there is no gold standard self-report measure of adherence (15, 23), we used a question that was pragmatic and natural to use in clinical practice, even though it has not been scientifically validated. Using validated

instruments in practice is not always easy, as many trials have measured physical activity using instruments whose scales do not easily convert to a pragmatic counselling message, which restricts their clinical usefulness (24).

There is an obvious risk of recall or social desirability bias with the question we used. Self-report always carries the potential risk of bias, including social desirability bias (25). Self-report tools have, however, usually been found to be accurate and reliable compared to objective quantification of physical activity through monitoring or direct measurement of energy expenditure (24, 26, 27). Still, possible bias must be considered when interpreting the results of this study.

These limitations should be balanced against the study's strengths. It is difficult to achieve high internal and external validity in the same study. We included a large number of patients in a routine care setting, which made it possible to perform statistically sound sub-group analyses. We also believe that many of the results can be generalised to other clinical settings (strong external validity). In addition, the intervention was highly pragmatic and may be employed when the use of simple questions and procedures is a necessity.

In conclusion, reasons for non-adherence differ between patients prescribed home-based activities and referred facility-based activities, as well as patients with specific characteristics. The information we have obtained may be valuable not only for professionals working in PHC, but also those working to develop PARs for use in other contexts. To further broaden our knowledge about adherence and non-adherence to PARs, more qualitative research in the form of patient interviews is needed.

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Competing interests: none declared.

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Tables

Table 1. Descriptive statistics presenting results of the univariate logistic regression on non-adherence to PARs.

	Adherence		*Non-adherence*				
	n	*%*	*n*	*(%)*	*OR*	*95% CI*	*P-value for OR*
***Total** (n=4,867)*	*3,509*	*72*	*1,358*	*28*			
Sex							*0.531*
Female	*2,368*	*67*	*903*	*67*	*1.00*		
Male	*1141*	*33*	*454*	*33*	*1.04*	*0.91-1.19*	
Age group (years)							*0.012*
18–29	*161*	*5*	*70*	*5*	*1.22*	*0.90-1.66*	
30–44	*639*	*18*	*300*	*22*	*1.32*	*1.09-1.59*	
45–64	*1,784*	*51*	*658*	*49*	*1.03*	*0.89-1.21*	
>65	*925*	*26*	*330*	*24*	*1.00*		
Activity level at baseline (7-day recall) (days)							*<0.001*
0	*833*	*28*	*542*	*44*	*2.10*	*1.75-2.52*	
1–2	*929*	*29*	*330*	*27*	*1.21*	*1.00-1.48*	
3–4	*604*	*19*	*142*	*12*	*0.80*	*0.64-1.02*	
5–7	*759*	*24*	*222*	*18*	*1.00*		
Activity type							*<0.001*
Home-based activity	*1,464*	*42*	*412*	*31*	*0.76*	*0.64-0.91*	
Facility-based activity	*1,291*	*37*	*649*	*49*	*1.36*	*1.15-1.61*	
Combination of home-based and facility-based activities	*715*	*21*	*265*	*20*	*1.00*		
Referral practitioner occupation							*0.260*
Physician	*1,194*	*35*	*488*	*37*	*1.18*	*0.98-1.42*	
Nurse	*1,031*	*30*	*405*	*31*	*1.13*	*0.93-1.38*	
Physiotherapist	*626*	*18*	*223*	*17*	*1.03*	*0.82-1.28*	
Other	*605*	*18*	*210*	*16*	*1.00*		
Reason for prescription							*<0.001*
Sedentary lifestyle	*113*	*3*	*48*	*4*	*1.09*	*0.75-1.56*	
Musculoskeletal disorder	*746*	*21*	*292*	*22*	*1.00*		
Being overweight	*292*	*8*	*111*	*8*	*0.97*	*0.75-1.26*	
Diabetes	*365*	*10*	*91*	*7*	*0.64*	*0.49-0.83*	
High blood pressure	*257*	*7*	*67*	*5*	*0.67*	*0.49-0.90*	
Cholesterol	*22*	*1*	*10*	*1*	*1.16*	*0.54-2.48*	
Mental ill-health	*114*	*3*	*42*	*3*	*0.94*	*0.54-1.38*	
Other	*124*	*4*	*30*	*2*	*0.62*	*0.41-0.94*	
Combination of reasons/diagnoses	*1,476*	*42*	*667*	*49*	*1.16*	*0.98-1.36*	

Data are presented as numbers (n) and proportions (%). P-values from the chi-square test

Table 2. Results from the multiple logistic regression analysis on non-adherence to PARs.

	OR	*95% CI*	*P-value*
Sex			*0.137*
Age group			*0.412*
Activity level at baseline (7-day recall) (days)			*<0.001*
0	*2.01*	*1.67-2.42*	
1–2	*1.20*	*0.98-1.46*	
3–4	*0.80*	*0.63-1.02*	
5–7	*1.00*		
Activity type			*<0.001*
Home-based activity	*0.73*	*0.60-0.89*	
Facility-based activity	*1.31*	*1.09-1.57*	
Combination of home-based and facility-based activities	*1.00*		
Reason for prescription			*0.001*
Sedentary lifestyle	*1.07*	*0.71-1.60*	
Musculoskeletal disorder	*1.00*		
Being overweight	*1.00*	*0.76-1.33*	
Diabetes	*0.85*	*0.62-1.16*	
High blood pressure	*0.82*	*0.59-1.13*	
Cholesterol	*1.42*	*0.63-3.20*	
Mental ill-health	*1.00*	*0.66-1.53*	
Other	*0.66*	*0.42-1.04*	
Combination of reasons/diagnoses	*1.29*	*1.07-1.55*	

Results are adjusted for age and sex. P-values from the chi-square test

Table 3. Descriptive statistics of reasons for non-adherence to PARs at follow-up, data are presented as numbers (n) and proportions (%).

		Main reason for non-adherence to PAR at follow-up (%)						
	n	*Sickness*	*Pain*	*Low motivation*	*No time*	*Economy*	*Other*	*P-value*
Total	*609*	*19*	*14*	*18*	*12*	*5*	*31*	
Sex	*608*							*0.05*
Female	*402*	*21*	*16*	*15*	*13*	*5*	*31*	
Male	*206*	*15*	*12*	*24*	*12*	*5*	*32*	
Age group (years)	*609*							*<0.001*
18–29	*38*	*8*	*3*	*18*	*18*	*21*	*32*	
30–44	*136*	*17*	*10*	*15*	*18*	*7*	*32*	
45–64	*298*	*19*	*14*	*20*	*12*	*4*	*31*	
>65	*137*	*25*	*22*	*16*	*5*	*1*	*31*	
Activity level at baseline (7-day recall) (days)	*558*							*0.054*
0	*289*	*20*	*14*	*22*	*9*	*5*	*30*	
1–2	*143*	*14*	*13*	*22*	*15*	*7*	*29*	
3–4	*40*	*18*	*15*	*12*	*18*	*2*	*35*	
5–7	*86*	*21*	*13*	*7*	*21*	*5*	*34*	
Activity type	*597*							*0.001*
Home-based activity	*164*	*22*	*18*	*31*	*11*	*1*	*18*	
Facility-based activity	*345*	*16*	*14*	*13*	*12*	*7*	*38*	
Combination of home-based and facility-based activities	*88*	*24*	*13*	*15*	*17*	*3*	*28*	
Referral practitioner occupation	*585*							*0.112*
Physician	*253*	*17*	*15*	*16*	*16*	*5*	*31*	
Nurse	*185*	*21*	*14*	*23*	*14*	*2*	*26*	
Physiotherapist	*73*	*25*	*16*	*15*	*7*	*7*	*30*	
Other	*74*	*19*	*12*	*19*	*5*	*9*	*35*	
Reason for prescription	*609*							*0.007*
Sedentary lifestyle	*37*	*11*	*19*	*13*	*11*	*11*	*35*	
Musculoskeletal disorder	*133*	*21*	*23*	*10*	*7*	*7*	*32*	
Being overweight	*73*	*12*	*7*	*25*	*11*	*3*	*42*	
Diabetes	*44*	*18*	*20*	*16*	*14*	*2*	*30*	
High blood pressure	*36*	*31*	*8*	*11*	*19*	*3*	*28*	
Cholesterol	*6*	*0*	*17*	*17*	*17*	*0*	*50*	
Mental ill health	*24*	*4*	*8*	*17*	*17*	*12*	*42*	
Other	*12*	*25*	*0*	*33*	*0*	*8*	*33*	
Combination of reasons/diagnoses	*244*	*21*	*13*	*22*	*14*	*4*	*25*	

Data are presented as numbers (n) and proportions (%).P-values from the chi-square test