ORIGINAL ARTICLE

How do general practitioners in Denmark promote physical activity?

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Abstract

Objective. The primary objective of this study was to quantify the frequency of advice given on type, frequency, duration, and intensity of exercise during physical activity (PA) promoting sessions by general practitioners. Second, to find GP characteristics associated with high quality of PA counselling. **Design.** A cross-sectional questionnaire survey. **Setting and subjects.** General practitioners in two Danish municipalities in central Copenhagen, Denmark. **Results.** 56.3% (223/396) of GPs returned the questionnaire. 95.5% (127/223) of the respondents reported giving advice on PA at least weekly. PA promotion included advice on type of exercise, duration, frequency, and intensity in 80% (interquartile range 60 to 90), 70% (50–80), 70% (50–90), and 60% (40–80) of the consultations, respectively. Length of consultation (minutes) was positively associated with increased chance of advice on type of exercise (OR 1.08; 95% CI 1.02–1.13), frequency (OR 1.09; 95% CI 1.03–1.16), and intensity (OR 1.06; 95% CI 1.01–1.11). Having attended a course on exercise promotion was associated with increased information on frequency (OR 1.94; 95% CI 1.05–3.60) and duration (OR 1.81; 95% CI 1.02–3.21). **Conclusion.** While GPs report frequently providing PA counselling, this often lacks specific advice on how to perform the exercise. GPs who have received training on PA promotion more often report providing advice on duration and frequency of exercise compared with GPs who have not received training on PA promotion.

Key Words: Exercise counselling, health promotion, primary care

Introduction

The positive effect of physical activity (PA) on human health and well-being is increasingly being recognized. Exercise has been proved to reduce risk of cardiovascular disease, type-2 diabetes, and all-cause mortality [1–3]. The primary effect of PA seems to be related to diseases that coexist with the increasingly sedentary lifestyle observed in the Western world. This has led to growing interest in PA as a health-promoting factor. Despite national campaigns and programmes between 25% and 40% of the Danish population are reported to have a sedentary lifestyle [4], which is comparable to other developed countries [5,6].

Since Danish general practitioners (GPs) are consulted by 85% of the population over a one-year period, and 95% over a three-year period, and are generally regarded as important resource persons in Danish local communities, they have a unique opportunity to provide their patients with appropriate counselling regarding PA [7,8]. PA counselling by

physicians and other health staff in primary care has to some extent proved effective to induce change in patients' exercise behaviour [9–11].

The majority of studies investigating PA promotion are concerned with who (i.e. patient characteristics) is receiving PA advice [12–14]. Very few studies focus on the content of exercise counselling in terms of intensity, frequency, duration, or the type of exercise recommended [15,16]. We conducted this study to gain knowledge about the content of PA promotion in Danish primary care. Second, we wanted to identify GP characteristics associated with a high frequency of specific exercise advice.

Material and methods

A postal survey was conducted using a self-administered questionnaire. The survey included all GPs ($n = 396$) in the two Danish municipalities of Copenhagen (512,000 inhabitants) and Frederiksberg (94,000 inhabitants).

Sedentary lifestyle is associated with a variety of diseases. General practitioners (GPs) have a unique opportunity to guide patients towards a healthier lifestyle

- >90% of GPs in Denmark report that they promote physical activity on a weekly basis.
- 70% of GPs report that their physical activity counselling includes advice on type of exercise and duration of exercise.
- 20% of GPs do not think that counselling on physical activity should be part of their job.

A pilot study of the questionnaire was carried out that included GPs from two Danish municipalities other than the study municipalities ($n = 30$). The clarity, relevance, and applicability of the questions were evaluated during the pilot study, and minor changes and amendments were added. A test-retest procedure was carried out after 2–3 weeks that included nine GPs. The test-retest analysis showed good agreement between first and second responses (Cohen's Kappa = 0.68; $n = 9$).

The questionnaire included 23 questions divided into four sections. The first section included questions on the respondents' demographic data. Content of PA counselling was measured in the second section, which included questions on how often the counselling on PA included advice on type, length, frequency, and/or intensity of exercise. The third section included questions concerning attitudes towards, knowledge about, and barriers to counselling on PA. The questions, including type of exercise/duration/intensity/frequency as part of the PA counselling, were formed as a 10-point scale from 0% to 100% with each step indicating a 10% increase. The fourth section included questions on the respondent's own level of PA in number of days/week engaging in moderate or high-intensity exercise for more than 30 minutes. Second, the respondents were asked to choose a phrase that best fitted their own exercise level. The phrases represented each of the six stages of changes described in the Transtheoretical Model of Change developed by Prochaska et al. (1992) [17]. Data on age, gender, years in practice, and practice size for all GPs in the included municipalities were obtained from a central register (Region H) making non-responder analysis possible.

The questionnaires were sent out in October 2007 with pre-paid return envelopes and an introductory letter containing relevant information on the study. A reminder was sent out to all non-responding practices after four weeks, and after six weeks all non-responding practices were contacted by telephone (see Figure 1).

Statistical analysis

All data handling and analysis were done in SPSS vs. 11.0. Data on content and procedure of PA counselling were non-parametric and thus are presented with median and interquartile range (IQR).

For identification of GPs characteristics associated with high frequency of PA advice, including type of exercise/duration/intensity/frequency, we used a stepwise backwards regression analysis. The PA advice content variables (e.g. type of exercise) were dichotomized (0: below median; 1: median and above, e.g. respondents including advice on type of exercise in 90% of PA counselling sessions was categorized as 1) and used as dependent variables. Characteristics of GPs were used as independent variables: sex (1 = female, 2 = male), age, years in practice, length of PA counselling, frequency of days per week the GP engaged in moderate to high-intensity exercise, courses on exercise counselling (1: yes, 2: no, or I do not know), GP's stage of change (1: action and maintenance, 0: pre-contemplation, contemplation, preparation, relapse). To reduce the risk of type-2 errors, we kept variables in the model, if the p-value was <0.01 rather than 0.05. The interaction terms sex $\times$ length of PA counselling and GP's exercise frequency $\times$ length of PA counselling were entered in the full models. The interaction terms had no significant impact on variation and were removed from the model.

Results

Survey response

The survey response flowchart is presented in Figure 1. The questionnaire was mailed to 396 GPs in 328 practices and we achieved a total response of 223/396 (56.3%) questionnaires. Please see Table I for demographic details.

On average, GP responders were 1.68 years younger (95% CI 0.1–3.2; $p = 0.037$) and had 106 more patients (95% CI 33–179; $p = 0.004$) than non-responders. The difference in number of years in practice was non-significant (mean diff. 1.3 years; 95% CI –0.5–3.0; $p = 0.15$). Overall, more female than male doctors returned the questionnaire ($\chi^2_1 = 7.8$, $p = 0.005$).

Frequency and content of PA counselling

Of all responding GPs, 57% (127/223) reported promoting PA daily, 38.6% (86/223) on a weekly basis and 4.5% (10/223) on a monthly basis or less frequently. No GPs reported never promoting PA. When GPs gave advice on PA, they reported providing

Figure 1. Flowchart of the postal survey Notes: GP = general practitioners, qu. = questionnaire. All percentages refer to the percentage of the full sample (396 practitioners).

specific recommendations on type of exercise, duration, frequency, and intensity on at least 60% of the occasions. In 40% (IQR 30–80) of cases PA promotion included written material and in 60% (IQR 30–80) the PA promotion was addressed on a later occasion. Please see Figure 2 and Table II for details.

In a logistic regression model, we identified which GP characteristics were associated with high-quality PA promotion (see Table III). Advice on all four variables of quality was associated with time spent on counselling. Reporting course activity on PA promotion was associated with advice on frequency and duration of exercise. Female gender was associated with increased chance of advice on type of exercise, and state of change with intensity of exercise. Age, years in practice, or the GP's own exercise behaviour was not significantly associated with advice on any of the quality variables.

Attitudes and barriers to PA counselling and promotion

The majority of GPs (80.2%) reported that promoting PA was one of their work tasks (174/217), while 19.8% (43/217) did not perceive it as their job or

were in doubt. GPs considered lack of patient motivation (125/223), lack of time (98/223), and lack of referral opportunities (85/223) as the main obstacles to successful PA counselling.

Discussion

Principal findings

More than 95% of the GPs reported counselling on PA at least weekly. In 70–80% of these counselling sessions, the GP reported giving advice on type of exercise, duration, and frequency of exercise. In only 60% of the cases was advice on intensity level given. The odds of the patient receiving specific PA advice were increased in cases with longer consultations, a female GP, and in cases where the GP had a course on PA promotion. Furthermore, one in five GPs were in doubt or did not think that counselling on exercise was part of their job.

Strength and weaknesses of this study

The strength of this survey was the method by which we developed the questionnaire, with pilot studies to

Table I. Demographic and counselling characteristics of questionnaire respondents.

	General practitioners n = 223
Female	113 50.7%
Age (SD)	53.4 (8.0)
Years working in general practice (SD)	15.1 (8.9)
Number of patients attached to the GP (SD)	1552.9 (333)
Frequency of exercise/week (SD)	2.6 (1.9)
Have you participated in a course on exercise promotion? (missing n = 0): ¹	
Yes	90 (40.4%)
No	125 (56.1%)
I do not know	8 (3.6%)
Do you consider exercise promotion a part of your job? (missing n = 6): ¹	
Yes	174 (80.1%)
No	13 (6.0%)
I do not know	30 (13.8%)
Is there written material on exercise advice in the waiting room? (missing n = 3): ¹	
Yes	168 (76.4%)
No	41 (18.6%)
I do not know	12 (5.5%)
How often do you advise your patients on exercise behaviour? (missing n = 0): ¹	
≥ weekly	213 (95.5%)
< weekly	10 (4.5%)
How often do you promote exercise behaviour to sedentary patients, without complications such as obesity or high blood pressure? (missing n = 0): ¹	
≥ weekly	116 (52.0%)
< weekly	107 (48.0%)
State of change – respondents' own motivational readiness for exercise (missing n = 2): ¹	
Exercises regularly, > 6 months	153 (69.2%)
Exercises regularly, < 6 months	6 (2.7%)
Have previously exercised regularly, but not currently	15 (6.8%)
Do exercise once in a while, but not regularly	27 (12.2%)
Do not exercise, but contemplate starting	10 (4.5%)
Do not exercise, and do not consider starting	10 (4.5%)

Note: ¹

Indicates missing values.

ensure that the questions were clear and relevant for the target group. We also had a test–retest kappa of 0.68, which is acceptable. The cross-sectional nature of the current study limits the association between GP characteristics and PA advice. Furthermore, this study was undertaken in an area of Denmark where GPs had the opportunity to refer patients for exercise (e.g. “green” prescriptions). The GPs in this region

Figure 2. “When you advise your patients on physical activity, how often does it include specific advice on type, duration, frequency, and intensity of exercise?” Answers provided by 223 general practitioners in Denmark. Note: The data are self-reported and presented as median and interquartile range.

could be more focused on exercise compared with regions of Denmark where exercise referrals are not a possibility. Even though the obtained response rate of 56.3% is within the range from similar studies [16, 18–20], inferences concerning the whole population should be made with caution. In general, it should be kept in mind that the highly subjective nature of a questionnaire study may predispose respondents to overstate their knowledge on the subject, as well as observing compliance with published recommendations. In addition one could expect recall bias, thus making it possible that the data are biased in one or the other direction. In other words, this study describes the GPs’ self-reported behaviour and not necessarily actual behaviour.

Current findings in relation to other studies

In a previous Australian study the GPs reported providing the patients with advice on frequency, intensity, and duration of exercise in 84%, 76%, and 77% of the cases, respectively [16]. This is very much in line with the current findings. We have not been able to identify other studies that have been as specific as

Table II. “When you advise your patients on physical activity, how often does your counselling include verbal information, written material, a follow-up interview, and how many minutes do you spend?”: Answers from Danish general practitioners.

	General practitioners n = 223
Type of exercise counselling:	
Verbal	100% (90–100)
Written material	40% (30–80)
Follow-up interview	60% (30–80)
Exercise prescription	30% (20–50)
Counselling time, minutes	11.0 (7.5–15.0)

Note: The data are self-reported and presented as median and interquartile range.

Table III. Multivariate backwards stepwise logistic regression analysis of factors associated with content of exercise promotion given by general practitioners.

Type of exercise, Frequency, Duration, Intensity	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Consultation, minutes	1.08	1.02–1.13	1.09	1.03–1.16	1.06	1.00–1.11	1.06	1.01–1.11
Female gender	2.04	1.15–3.64	1.17	0.91–3.09	–	–	–	–
Course on PA promotion ¹	–	–	1.94	1.05–3.60	1.81	1.02–3.21	–	–
State of change ²	–	–	–	–	–	–	1.98	1.06–3.71

Notes: OR: odds ratio; 95% confidence interval. Only variables with p -value ≤ 0.10 in the regression model are included (e.g. variation in “Type of exercise” is explained by “consultation, minutes” and “gender”). The full model included age, years in practice, number of days/week the GP engaged in moderate to high-intensity exercise for at least 30 minutes. ¹The GP reported having attended a course on physical activity promotion. ²GPs’ current motivational level for change in own exercise habits (1: active vs. 0: non-active).

these on content of exercise advice. However, an American study found that only 38% of those patients who had been advised to increase their PA level received help formulating a specific plan, and 42% received follow-up support [12]. The current findings suggest a higher number of patients received some kind of plan and 60% of the Danish GPs reported some sort of follow-up activity. A UK based study found that 47% of GPs promoted PA30 $\times$ 5 (30 minutes of brisk activity five times a week), which includes intensity, duration, and frequency. Advice on intensity was given in only 60% of the cases, consistent with other reports [16,18–21]. Whereas metabolic fitness is readily obtained at lower intensities, increase in cardiovascular fitness is gained from exercising at high-intensity levels. Furthermore, the duration of exercise necessary to increase cardiovascular fitness decreases if you work at high-intensity levels [22]. The importance of addressing the intensity issue is supported by a large cross-sectional study, which suggests that exercise intensity is inversely associated with the prevalence of hypertension and diabetes [23]. Therefore, advice on intensity could be used in motivating patients to a healthier lifestyle (i.e. the higher the exercise intensity, the shorter period of time you have to spend exercising).

The high frequency of exercise counselling by GPs in this sample is positive and similar to other questionnaire studies [18–21]. These findings are somewhat contradicted by direct observation of exercise counselling in family practices, which reported PA counselling in 22.3% of the visits [24]. This could mean that GPs have a tendency to overestimate their PA counselling when asked. Asked to report the average time spent on PA counselling, the GPs on average spent 11 minutes. Similar studies have reported GPs’ average PA counselling to be 0.78 minutes in direct observation [24] and in another survey the majority spent from one to five minutes [25]. We have no explanation for this large discrepancy, but it could

be due to the non-specific nature of the question asked (“State the average time spent on a PA counselling session”).

The most frequently reported barriers to GPs’ successful PA counselling were lack of patient motivation, lack of time, and lack of referral opportunities. Lack of time and patient motivation are consistently mentioned in all studies as primary barriers [19–21], while lack of referral opportunities probably reflects local conditions.

Implications and perspectives

Although successful exercise counselling consists of other issues than those addressed in this article, we do believe that advice on type of exercise, frequency, duration, and intensity of exercise constitutes an idea of high-quality PA counselling. While GPs report frequent counselling on PA, it seems that specific advice on how to perform exercise is missing in a substantial proportion of the sessions. In this study we found that increased time and education were associated with increased quality of PA counselling. However, the design of the study does not allow us to claim causality.

Future research

Future research in Scandinavian general practices should address both physician and patient obstacles to increased PA. The knowledge gained from this and similar studies could potentially be used in intervention studies that address improved strategies for PA activity.

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Declaration of interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of the paper.

References

- [1] Lawlor DA, Hanratty B. The effect of physical advice given in routine primary care consultations: A systematic review. *J Public Health Med* 2001;23:219–26.
- [2] Hu G, Tuomiletho J, Silventoinen K, Peltonen M, Jousilahti P. The effect of physical activity and body-mass index on cardiovascular, cancer and all-cause mortality among 47212 middle-aged Finnish men and women. *Int J Obes* 2005;29: 894–902.
- [3] Sui X, LaMonte MJ, Laditka JN, Hardin JW, Chase N, Hooker SP, et al. Cardiorespiratory fitness and adiposity as mortality predictors in older adults. *JAMA* 2007;298:2507–16.
- [4] Sjøø A, Thomasen KK, Andersen LB. Secular trends in acute myocardial infarction in relation to physical activity in the general Danish population. *Scand J Med Sci Sports* 2003;13:224–30.
- [5] Adult participation in recommended levels of physical activity – United States, 2001 and 2003. *JAMA* 2006;295: 27–9.
- [6] Kavouras SA, Panagiotakos DB, Pitsavos C, Chrysoshoou C, Anastasiou CA, Lentzas Y, et al. Physical activity, obesity status, and glycemic control: The ATTICA study. *Med Sci Sports Exerc* 2007;39:606–11.
- [7] Olesen F, Lous J. [Disease prevention in general practice]. In: Goldstein H, editor. *Sygdomsforebyggelse. Hverdag og visioner. 28 eksperter bud på forebyggelse i sundhedsfaglig sammenhæng* [Disease prevention. Proposals and ideas on disease prevention from 28 health experts]. Viborg: Akademisk Forlag a/s; 2001. p. 31–42.
- [8] Vedsted P, Olesen F. [The use of Danish day-time general practice: Status and perspectives]. *Ugeskr Laeger* 2005;167: 3280–2.
- [9] Petrella RJ, Lattanzio CN, Shapiro S, Overend T. Improving aerobic fitness in older adults. *Can Fam Physician* 2010;56: e191–e200.
- [10] Sørensen JB, Skovgaard T, Pluggard L. Exercise on prescription in general practice: A systematic review. *Scand J Prim Health Care* 2006;24:69–74.
- [11] Sørensen J, Sørensen JB, Skovgaard T, Bredahl T, Puggard L. Exercise on prescription: Changes in physical activity and health-related quality of life in five Danish programmes. *Eur J Public Health* 2010;21:56–62.
- [12] Glasgow RE, Eakin EG, Fisher EB, Bacak SJ, Brownson RC. Physician advice and support for physical activity: Results from a national survey. *Am J Prev Med* 2001;21:189–96.
- [13] Hinrichs T, Moschny A, Klaaßen-Mielke R, Trampisch U, Thiem U, Platen P. General practitioner advice on physical activity: Analyses in a cohort of older primary health care patients (getABI). *BMC Fam Pract* 2011;12:26.
- [14] Croteau K, Schofield G, McLean G. Physical activity advice in the primary care setting: Results of a population study in New Zealand. *Aust N Z J Public Health* 2006;30:262–7.
- [15] McKenna J, Vernon M. How general practitioners promote “lifestyle” physical activity. *Patient Educ Couns* 2004; 54:101–6.
- [16] Bull FCL, Schipper ECC, Jamrozik K, Blanksby BA. How can and do Australian doctors promote physical activity? *Prev Med* 1997;26:866–73.
- [17] Prochaska JP, Diclemente CC, Norcross JC. In search of how people change. Applications to addictive behaviors. *Am Psychol* 1992;47:1102–14.
- [18] Petrella RJ, Lattanzio CN, Overend TJ. Physical activity counseling and prescription among Canadian primary care physicians. *Arch Intern Med* 2007;167:1774–81.
- [19] Ribera AP, McKenna J, Riddoch C. Attitudes and practices of physicians and nurses regarding physical activity promotion in the Catalan primary health-care system. *Eur J Public Health* 2005;15:569–75.
- [20] McKenna J., Naylor PJ, McDowell N. Barriers to physical activity promotion by general practitioners and practice nurses. *Br J Sports Med* 1998;32:242–7.
- [21] Douglas F, Torrance N, van TE, Meloni S, Kerr A. Primary care staff’s views and experiences related to routinely advising patients about physical activity: A questionnaire survey. *BMC Public Health* 2006;6:138.
- [22] Helgerud J, Hoydal K, Wang E, Karlsen T, Berg P, Bjerkaas M, et al. Aerobic high-intensity intervals improve VO₂max more than moderate training. *Med Sci Sports Exerc* 2007;39: 665–71.
- [23] Williams PT. Relationship of running intensity to hypertension, hypercholesterolemia, and diabetes. *Med Sci Sports Exerc* 2008;40:1740–8.
- [24] Podl TR, Goodwin MA, Kikano GE, Stange KC. Direct observation of exercise counselling in community family practice. *Am J Prev Med* 1999;17:207–10.
- [25] Abramson S, Stein J, Schaufele M, Frates E, Rogan S. Personal exercise habits and counseling practices of primary care physicians: A national survey. *Clin J Sport Med* 2000;10: 40–8.