

Recommendations by Queensland general practitioners to be more physically active: a quantitative study exploring which patients were recommended which activities and what action they took

Roma Robertson, Ruth Jepson, Ashley Shepherd, Rhona McInnes

School of Nursing, Midwifery and Health, University of Stirling, Stirling, Scotland, UK

Correspondence to:

Roma Robertson, School of Nursing, Midwifery and Health , University of Stirling, Stirling, Scotland, UK. FK9 4LA

e-mail: roma.robertson@stir.ac.uk

Tel: +44 (0)1968 672051

Abstract

Objective:

To ascertain the extent to which general practitioners in Queensland, Australia recommend physical activity to their patients. In addition, the types of patients they most commonly target, the types of activities they suggest, and how patients respond to the recommendations.

Methods:

Questions designed to answer the research objectives were included in the Queensland Social Survey. Univariate, bivariate and logistic regression analyses were employed linking relevant variables with demographic data available from the survey.

Results:

1261 people completed the survey. In the previous year, 225 (18%) of them were recommended by a general practitioner to do more physical activity. These people were more likely to have a higher body mass index (OR=1.02; 95%CI = 1.01-1.03) and rate their general health as fair or poor (OR= 3.76; 95%CI = 2.37-5.06). Walking was the most common activity recommended (75%). Only 18% of people were not pleased to be recommended to take more exercise and most (67%) reported following the advice. Blue collar workers (OR=0.37; 95%CI = 0.15-0.92) and older people (OR=0.96; 95%CI = 0.94-0.98) were less likely to follow the recommendations.

Conclusions:

General practitioners in Queensland are recommending increased physical activity (predominantly walking) to patients with weight problems and with medical problems. Patients are usually pleased to receive the advice and act upon it.

Implications:

General practitioners should be aware that physical activity recommendations are received favourably by most patients and there is further potential to improve public health by giving physical activity advice to all sedentary and/or overweight patients when appropriate.

Abstract Word count = 250

Whole article word count (includes tables and questionnaires) = 5643;(4843 without questionnaires)

Key words

Physical activity; primary care; health behaviours; primary prevention; walking

Introduction

Regular physical activity is recognised globally and nationally as an important factor in the maintenance of good health through reducing the risk of many diseases such as cardiovascular disease, stroke, type 2 diabetes and colon and breast cancer, and by having a positive effect on conditions such as hypertension, osteoporosis, obesity, osteoarthritis and mental and psychological ill health.^(1;2) For adults, 30 minutes of moderate-intensity physical activity on five days per week is recommended, or more for weight control.^{1,3} The World Health Organisation estimates that 60% of the world's population fails to meet the recommended levels of physical activity,¹ although some estimates in Australia are lower at 49% to 53%.^{4,5}

Diseases related to physical inactivity cause considerable personal and societal burden^{2,6,7} and governments worldwide are therefore keen to encourage people to meet the recommended daily levels of physical activity. A variety of methods are employed to try to achieve this including educational, environmental and health initiatives. Because, in any one year the majority of the adult population consult primary care health professionals (mainly general practitioners),^{8,9} one currently advocated health initiative is for these health professionals to encourage patients to meet the recommended levels of physical activity in their daily lives¹⁰ in order to promote good health or as part of the treatment for specific diseases such as Type 2 diabetes.¹¹ This type of health promotion has been shown to be both effective^{9,12} and cost effective,¹³ particularly in conjunction with GP training and support.¹⁴

In 2003, 24% of the Central Queensland population who reported seeing their general practitioner in the past year received advice about physical activity.¹⁵ However, it is not known how this has changed, whether patients consider advice about increasing physical activity from a health professional appropriate and whether they follow the advice.

The aims of this research were to estimate the extent to which primary care health professionals are recommending physical activity to their patients and to compare this with general practitioner data collected in 2003:¹⁵ to explore the range of health conditions for which people are recommended physical activity; the characteristics of patients recommended more physical activity; and the type of physical activity recommended. We also wanted to ascertain people's opinions on health professionals recommending physical activity and whether they took up the recommendation. These findings would be important to health professionals to encourage patients to be more physically active and in tailoring methods of doing this for different patient groups.

Methods

The Queensland Social Survey provided an opportunity to ask questions to answer our research aims and eight questions were commissioned in the 2010 Queensland Social Survey.

Participants and sampling procedures

Participants comprised a random sample of the adult population of Queensland, Australia who were contacted in July and August 2010 as part of a large-scale Computer-Assisted Telephone-Interview survey conducted by the Population Research Laboratory at CQUniversity, Rockhampton, Queensland. The target population was all persons 18 years of age or older who, at the time of the survey, were living in a dwelling unit in Queensland and who could be contacted by the direct-dial, land-based telephone service. Within each household, one eligible person was selected as the respondent for the 35 minute interview to ensure an equal, yet random, selection of male and female participants. The response rates were calculated based on standard definitions of the American Association for Public Opinion Research¹⁶ and include complete and partial interviews as a proportion of complete and partial interviews plus refusals, non contactables and those found to be ineligible.

The survey instrument comprised three components: a standardised introduction; questions reflecting the specific interests of researchers (including the eight questions for this study); and a set of standard core and demographic questions.

Questions relating to this research

Respondents were asked if, in the past 12 months, a health professional had recommended that they do some exercise or physical activity or increase their activity level. If so, they were asked what type of health professional, how pleased they felt about the recommendation, what activity/ies they were recommended to do and for what reason. They were also asked if they followed the advice given and, if not, the main reason for not doing so. If physical activity was not recommended respondents were asked how they would feel about this if they had been and these answers were combined with the answers from people who had been recommended to be more physically active. All questions had a range of fixed responses or respondents could specify another answer. In this case, answers were grouped into new categories or added to pre-existing ones by one author (RR) to simplify analysis.

To explore relationships between physical activity recommendations and characteristics of the population we used a selection of questions from the standard core and demographic survey questions. These included age, sex, geographic location, years of education, occupational category, country of birth, smoking status and body mass index (calculated and categorised by the survey administrators from self reported weight and height).

The 2010 Queensland Social Survey received approval by the Human Ethics Research Review Panel at CQUniversity.

Analyses

Primary care recommendations for patients to meet levels of physical activity which benefit their health were the main focus for this paper and the principal data analysis was restricted to cases where a general practitioner was reported to have recommended a patient to be more physically active for the benefit of their health. We therefore did not include cases where the recommendation was for a short term injury or surgical procedure. Following discussion, we did include back pain or problems as these are often chronic conditions and being physically active is an important preventative measure.

Data were analysed using SPSS for Windows (version 16.0) statistical software package. Simple frequencies and percentages were used to describe univariate data and chi squared tests to consider associations between pre-ordained variables. Variables with an association with probability of 0.3 or less were included in logistic regression models, weighted to compensate for unrepresentativeness in the age categories, to determine independent influences on physical activity recommendations and self reported following of the recommendation. The occupational category and paid employment status variables were amalgamated to increase the number of cases with complete data in the logistic regression.

Results

The telephone survey was completed by 1261 people, an overall response rate of 35.2%. Six hundred and thirty five (50.4%) respondents were male and 626 (46.6%) were female and the mean age was 52.8 years (range 18 – 93 years). Characteristics of the sample population are given in Table 1. There was over sampling of people aged 45 years and over.

Three hundred and eleven (24.7%) respondents reported being recommended by a health professional, in the past year, to do some exercise or physical activity or increase their activity level. Thirty four (11%) of these recommendations were for specific short term treatment of

injuries (n=26) or for pre or post operative surgical care (n=8) rather than an increase in lifestyle or health enhancing physical activity which is the focus of this paper and these cases have therefore not been included with the population recommended physical activity. General practitioners (GPs or primary care doctors) made 225 (81%) of these eligible recommendations. The remaining 52 recommendations were from specialist doctors (23), physiotherapists (7), dieticians (5), nurses (5), chiropractors (4), midwives (2), occupational therapists (2), an alternative therapists and a psychologist plus 2 cases where the type of health professional was not given. Since our primary interest is the promotion of physical activity in primary care and the numbers of health professionals, apart from GPs, were small we have analysed these data considering the recommendations of health enhancing physical activity made by GPs (n=225, 17.8%). (See Table 1)

Reasons for physical activity recommendations

The most common reason given for being recommended to be more physically active by a GP was being overweight; 89 (40%) of respondents. Thirty nine (17%) people were at risk of or had heart or circulation problems. Of these, 19 said they were at risk of heart problems, 15 had high blood pressure, 3 said they had high cholesterol, one that they had heart problems and one circulation problems. Another 34 (15%) people had other physical health problems where physical activity is important in managing the disease; diabetes (20), asthma (2), arthritis (8), osteoporosis (4). Seventeen people (8%) said they had been recommended to take more exercise because they were not very active and sixteen people (7%) were recommended to be physically active for mental health problems – depression (10), anxiety (3) and stress (3). Seven people (3%) had back problems and 23 (10%) gave other reasons including to improve their fitness (2), for their general health (11), pregnancy (1) or because they were old (2). (See Table 2)

Type of physical activities recommended

Table 2 shows the number of times different activities were recommended. Walking was the most common type of activity recommended with 175 (75%) of the respondents being recommended to walk more. Twenty seven (13%) were advised to participate in swimming, aqua aerobics, hydrotherapy or low impact exercises and 23 (13%) to use the gym, use weights or go to aerobics classes. Swimming was recommended most frequently to people with back pain (29%) as were stretching and strengthening exercises (and related physical activities) (33%).

Characteristics of people recommended to be more physically active by a general practitioner

Table 1 details the characteristics of people who were recommended health enhancing exercise by a GP. People were significantly more likely to be recommended to do more exercise if they were obese (as measured by their current body mass index). Thirty four percent of people who were obese, compared to 15%, 7% and 4% of overweight, acceptable weight and underweight people respectively ($p < 0.001$), were recommended to increase levels of physical activity by a general practitioner.

People who reported poorer health were also more likely to have been recommended to be more physically active, with 29% of people who reported fair or poor health being recommended to do more exercise compared to 10% of those reporting excellent or very good health and 25% of those reporting good health ($p < 0.001$).

A higher proportion of respondents aged 51-65 years and 35-50 years were recommended to be more physically active (21% and 18% respectively) than their younger or older counterparts (those aged 18 to 34 years or over 65 years – 13% and 15% respectively) ($p = 0.08$).

A greater proportion of people with less than 10 years of education (21%) were recommended to be more physically active compared to people with 11-12 years, 13-14 years and 15+ years – 19%, 12%, and 17% respectively ($p = 0.06$).

There was no difference in the proportion of people in different occupational categories being recommended exercise in the past year with 17% of professional workers, 21% of white collar workers and 22% of blue collar workers being recommended exercise ($p=0.3$). Employment status (in paid employment or not), smoking status, country of birth, geographic location and gender were not related to exercise recommendation either.

Logistic regression analysis ($n=1249$) revealed that poorer self reported health status and a higher body mass index increased the likelihood of being recommended to be more physically active by a GP. The odds ratio for someone who rated their health to be fair or poor compared to someone who rated their health excellent or very good was 3.76 (95% CI = 2.37 to 5.06) and compared to someone who rated their health good the odds ratio was 2.87 (95% CI = 2.49 to 5.67). The odds ratio for a one unit increase in body mass index was 1.02 (95% CI = 1.01 to 1.03).

Opinions on being recommended physical activity and subsequent behaviour

One hundred and six (50%) respondents who had been recommended physical activity were 'pleased' or 'very pleased' about this, 79 (32%) were 'neutral' and 42 (18%) were 'not pleased at all' or 'not very pleased'. This compared favourably to those not recommended more exercise who reported that if they had been recommended more exercise the corresponding percentages would be 44%, 33% and 23%. ($p<0.001$). (See Table 1)

Of those recommended increased physical activity, 150 (67%) reported following the recommendation. Characteristics of these respondents are shown in Table 1. Bivariate analysis showed that the only characteristic significantly associated with following exercise recommendations was occupational category with 71% of professional workers, 82% of white collar workers and 50% of blue collar workers following exercise recommendations ($p=0.15$). Weighted logistic regression modelling ($n=220$) showed that occupational category and age

predicted whether a respondent followed the physical activity recommendation. Older people were less likely to follow exercise recommendation - the adjusted odds ratio for each extra year of life was 0.96 (95% CI = 0.94 to 0.98). Blue collar workers were also less likely to follow recommendations to be more physically active – the adjusted odds ratio for a blue collar worker compared to a professional worker was 0.37 (95% CI = 0.15 to 0.92). White collar workers and unemployed did not differ significantly from professional workers.

The main reasons given for not following the advice (n=75) were not having time (36%), finding increasing physical activity levels too physically difficult or poor health/tiredness preventing it (23%), not thinking that the advice was relevant or appropriate or already taking plenty exercise (13%), lack of motivation (9%), disliking exercise (9%), inclement weather (3%), poor mental health (3%) and problems accessing the physical activity (1%).

Discussion

Our results show that general practitioners (primary care doctors) recommended 18% of the survey sample to increase their levels of physical activity, slightly less than the 24% found in 2003 in a similar survey.¹⁵ Based on previously collected data that indicate that approximately 80% of the population visit a doctor in a year^{8,15} and that about 60% of these patients do not meet the recommended level of physical activity^{1,15} we would expect approximately 600 of the 1261 survey respondents to be candidates for general practitioner physical activity promotion. Given the many barriers to opportunistic health promotion during general practitioner consultations,¹⁷ recommending increasing exercise to 225/600 (38%) of eligible patients, as estimated in this study, suggests general practitioners are incorporating this in to their practice. Our results support findings from other studies^{15,17} which suggest that general practitioners appear to be targeting patients with weight problems and existing medical conditions that are known to benefit from exercise. While this is a good first line approach there remains potential to target all

sedentary patients as a preventative measure.¹⁸ For example, only 15% of overweight people in this survey reported exercise recommendations and a more concerted approach with this group of people might prevent greater levels of obesity.

Recommendations to be more physically active did not appear to be significantly biased towards any particular demographic group, as was shown previously,¹⁵ although there was a trend for middle aged people to be targeted more. It is understandable that younger people (who in general have better health and are less likely to visit a health professional) and older people (who are more likely to have more health problems that might limit their ability to be more physically active) reported being less likely to be recommended physical activity, but the general principle of being physically active for the benefit of health applies equally to all and there is perhaps potential for older people to be supported to increase their levels of physical activity.

Earlier data from Queensland has shown that only 33% of pregnant women met physical activity guidelines¹⁹ and in our study only two respondents reported a physical activity recommendation from a midwife. It therefore seems that there is potential for health professionals to encourage pregnant women to meet health enhancing levels of physical activity. Pregnancy is a unique and critical period in the life course for women and consequently they may be more likely to change their behaviour which could also have a positive impact on other members of the family. It is also a time when physical activity for health can be promoted to a large section of the community who might not otherwise be in contact with health professionals. An increase in physical activity during pregnancy has been suggested to improve pregnancy outcomes independent of weight.²⁰

Health professionals are advocating walking to the vast majority of patients recommended to exercise more. This low cost activity, that can be integrated into daily living more easily than other forms of exercise (e.g. people can get off a bus one stop earlier), has been shown to be as effective as leisure centre classes²¹ and does not discriminate against more disadvantaged people

in the ways that gym membership or other activities requiring specialist equipment might do.

Walking is also promoted locally through the 10,000 Steps project^{22,23} which provides web based support²⁴ and it has been shown that people who walk more are more likely to meet the recommended levels of physical activity.⁴

Most respondents were positive about being recommended physical activity, whether or not this had happened to them, suggesting that health professionals should not be shy of giving this advice. Self reported following of health professional recommendations to increase exercise was also high; another encouraging sign. However, this study highlighted that blue collar workers and older people were less likely to report following the advice suggesting that further support could be necessary for these groups.

As with all surveys, the results of this study are subject to limitations from recall and social desirability bias which could introduce inaccuracies such as over or underestimating the time since any recommendation to increase physical activity was given, forgetting the main reason for the recommendation and increasing the reports of following the recommendations. In addition, it is difficult to estimate how generalisable the results are since much of Central Queensland has been subject to a high profile physical activity promotion campaign, '10,000 Steps',^{21,22} in which general practitioners have been involved²⁵ and this might have increased the number of physical activity recommendations in this area. In addition, because of this campaign, public awareness of the benefits of physical activity could be higher than in many other areas and the population more amenable to recommendations. However, the health benefits of physical activity are reported frequently throughout the media²⁶ and there have been other campaigns to increase physical activity levels through primary care recommendations and referrals.²⁷ Although the response rate was low, the study population reflected the general population demographics apart from undersampling in younger age groups and we have weighted our regression analysis to account for this.

Conclusions

We estimate that general practitioners are recommending increasing physical activity to over a third of the population they see who do not meet the recommended levels of physical activity.

They are most likely to target people who are overweight or obese, or who have an existing medical condition that is known to benefit from meeting the recommended levels of activity.

Walking is the most popular activity recommended and most people are pleased to receive the recommendation and follow it. We recommend that general practitioners continue to provide this advice and recommend walking and other physical activities, whenever appropriate, to all patients who do not meet minimum levels of physical activity for health benefit.

Acknowledgements:

School of Nursing, Midwifery and Health, University of Stirling which funded the commissioned questions.

References

1. World Health Organization. Global Strategy on Diet, Physical Activity and Health. World Health Organization . 2004.
2. Stephenson J, Bauman AE, Armstrong T, Smith BJ, Bellew B. The Costs of Illness Attributable to Physical Activity in Australian Adult Population: A Preliminary Study. Canberra (AUST): The Australian Sports Commission . 2000.
3. Department of Health and Ageing. National Physical Activity Guidelines for Australians. 1999. Canberra (Australia), Commonwealth of Australia.
4. Chau J, Smith BJ, Bauman A, Merom D, Eyleson-Annan M, Chey T et al. Recent trends in physical activity in New South Wales. Is the tide of inactivity turning? Aust N Z J Public Health 2008; 32(1):83-85.
5. Vandelanotte C, Duncan MJ, Caperchione C, Hanley C, Mummery WK. Physical activity trends in Queensland (2002 to 2008): are women becoming more active than men? Aust N Z J Public Health 2010 Jun;34(3):248-54 2010; 34:248-254.
6. Allender S, Foster C, Scarborough P, Rayner M. The burden of physical activity-related ill health in the UK. J Epidemiol Community Health 2007; 61(4):344-348.

7. Katzmarzyk PT, Gledhill N, Shephard RJ. The economic burden of physical inactivity in Canada. *CMAJ* 2000; 163(11):1435-1440.
8. Lethbridge-Cejku M, Schiller JS, Bernadel L. Summary health statistics for U.S. adults: National Health Interview Survey, 2002. *Vital Health Stat* 2004; 10(222):1-151.
9. Eakin EG, Glasgow RE, Riley KM. Review of primary care-based physical activity intervention studies: effectiveness and implications for practice and future research. *J Fam Pract* 2000; 49(2):158-168.
10. Chakravarthy MV, Joyner MJ, Booth FW. An Obligation for Primary Care Physicians to Prescribe Physical Activity to Sedentary Patients to Reduce the Risk of Chronic Health Conditions. *Mayo Clinic Proceedings* 2002; 77(2):165-173.
11. Sigal RJ, Kenny GP, Castaneda-Sceppa C. Physical Activity/Exercise and Type 2 Diabetes . *Diabetes Care* 2004; 27:2518-2539.
12. Smith BJ, Merom D, Harris P, Bauman A. Do primary care interventions to promote physical activity work? A systematic review of the literature. 2002. Melbourne, Australia, The National Institute of Clinical Studies.
13. Dalziel K, Segal L, Elley CR. Cost utility analysis of physical activity counselling in general practice.
14. Sims J, Huang N, Pietsch J, Naccarella L. The Victorian Active Script Programme: promising signs for general practitioners, population health, and the promotion of physical activity. *Br J Sports Med* 2004; 38(1):19-25.
15. Eakin E, Brown W, Schofield G, Mummery K, Reeves M. General practitioner advice on physical activity--who gets it? *Am J Health Promot* 2007; 21(4):225-228.
16. The American Association for Public Opinion Research. Standard Definition: Final Dispositions of Case Codes and Outcome Rates for Surveys. 3rd ed. Lenexa, Kansas USA: AAPOR, 2004.
17. Bull FC, Schipper EC, Jamrozik K, Blanksby BA. Beliefs and behaviour of general practitioners regarding promotion of physical activity. *Aust J Public Health* 1995; 19(3):300-304.
18. Buffart, L. M., van der Ploeg, H. P., Smith, B. J., Kurko, J., King, L., & Bauman, A. E. 2009, "General practitioners' perceptions and practices of physical activity counselling: changes over the past 10 years", *Br J Sports Med*.2009 Dec;43(14):1149.-53.Epub.2008.Jul 15., vol. 43, pp. 1149-1153.
19. Wilkinson SA, Miller YD, Watson B. Prevalence of health behaviours in pregnancy at service entry in a Queensland health service district. *Aust N Z J Public Health* 2009; 33(3):228-233.
20. Weissgerber TL, Wolfe LA, Daview GAL, Mottola M. Exercise in the prevention and treatment of maternal-fetal disease: a review of the literature. *Applied Physiology, Nutrition and Metabolism* 2006; 31:661-674.
21. Isaacs AJ, Critchley JA, See Tai S, Buckingham K, Westley D, Harridge SDR et al. Exercise Evaluation Randomised Trial (EXERT): a randomised trial comparing GP

referral for leisure centre-based exercise, community-based walking and advice only. 2007. Health Technology Assessment; vol11: No.10.

22. Brown W, Eakin EG, Mummery WK, Trost S. 10,000 Steps Rockhampton: Establishing a Multi-Strategy Physical Activity Promotion Project in a Queensland Community. Australian Journal of Health Promotion 2003; 14(2):95-100.
23. Brown W, Mummery WK, Eakin EG, Schofield G. 10,000 Steps Rockhampton: Evaluation of a whole of community approach to improving population levels of physical activity. Journal of Physical Activity Health 2006; 3(1):1-14.
24. 10,000 Steps web site. <http://www.10000steps.org.au/> Last accessed 6-12-2010.
25. Eakin EG, Brown WJ, Marshall AL, Mummery K, Larsen E. Physical activity promotion in primary care: bridging the gap between research and practice. Am J Prev Med 2004; 27(4):297-303.
26. Chau J, Bonfiglioli C, Chey T, Bauman A. The Cinderella of public health news: physical activity coverage in Australian newspapers, 1986-2006. Aust N Z J Public Health 2009; 33(2):189-192.
27. Elley CR, Kerse N, Arroll B, Robinson E. Effectiveness of counselling patients on physical activity in general practice: cluster randomised controlled trial. BMJ 2003; 326(7393):793.

Table 1. Characteristics of total sample, those recommended to do more health enhancing exercise by a GP and those who reported following the exercise recommendation.

	All sample	Recommended health enhancing exercise by a GP in past year	P value*	Followed exercise recommendation	P value**
	N (%)	N (%)		N (%)	
All (n=1261)	1261 (100%)	225 (18%)		150 (12%)	
Age (n=1251)					
18-34	166 (13%)	22 (10%)		19 (13%)	
35-50	389 (31%)	71 (32%)		50 (34%)	
51-65	429 (34%)	90 (40%)		56 (38%)	
>65	267 (21%)	40 (18%)	P=0.08	24 (16%)	P=0.12
Male (n=1261)	635 (50%)	110 (49%)	P=0.6	68 (45%)	P=0.13
Geographic area (n=1257)					
City	656 (52%)	110 (49%)		69 (47%)	
Town	321 (26%)	67 (30%)		48 (32%)	
Rural	280 (22%)	46 (21%)	P=0.2	31 (21%)	P=0.5
Country of birth (n=1261)					
Australia	1014 (80%)	181 (80%)		122 (81%)	
Other	247 (20%)	44 (20%)	P=0.9	28 (19%)	P=0.8
Years of education (n=1250)					
1-10	356 (29%)	75 (34%)		45 (30%)	
11-12	257 (21%)	49 (22%)		34 (23%)	
13-14	199 (16%)	24 (11%)		17 (11%)	
15+	438 (35%)	75 (34%)	P=0.06	53 (36%)	P=0.5
In paid employment (n=1261)	744 (59%)	139 (62%)	P=0.4	96 (64%)	P=0.4
Occupational category (n=728)					
Professional	420 (58%)	70 (52%)		50 (53%)	
White collar	161 (22%)	34 (25%)		28 (30%)	
Blue collar	147 (20%)	32 (24%)	P=0.3	16 (17%)	P=0.02
Self reported general health status					
Excellent/Very good	632 (50%)	62 (28%)		42 (28%)	
Good	417 (33%)	102 (45%)		68 (45%)	
Fair/Poor	210 (17%)	61 (27%)	P<0.001	40 (27%)	P=0.97

Current BMI (n=1254)					
Underweight	23 (2%)	1 (0.5%)		1 (0.07%)	
Acceptable weight	408 (33%)	29 (13%)		20 (13%)	
Overweight	448 (36%)	65 (29%)		46 (31%)	
Obese	375 (30%)	127 (57%)	P<0.001	82 (55%)	P=0.7
Current smoker (n=1260)	184 (15%)	39 (17%)	P=0.2	24 (16%)	P=0.6
Attitude to PA recommendation (n=1242)					
Not pleased	276 (22%)	38 (18%)		20 (13%)	
Neutral	404 (33%)	67 (32%)		45 (30%)	
Pleased	562 (45%)	106 (50%)	P=0.18	84 (56%)	P=0.13

*Chi squared test comparing those who were recommended health enhancing physical activity by a GP and those who were not.

**Chi squared test comparing those who followed recommendation and those who did not.

Table 2. Percentage of people recommended each activity category by reason for recommendation

<u>Self reported reason for being recommended to be more physically active</u>	Total number (%) N=225	Percentage of people with each condition recommended each activity by a GP						
		Walking (n=175)	Swimming, aqua aerobics, hydrotherapy, low impact exercise (n=27)	Gym, aerobics, weights (n=23)	Jogging/running/cycling (n=16)	Competitive sport e.g. tennis (n=6)	Strength training, stretching, yoga, pilates, tai chi (n=8)	No particular activity (n=27)
	N (%)	%	%	%	%	%	%	%
Overall percentage*	225 (100)	78	12	10	7	3	4	12
Overweight	88 (39)	75	12	12	9	2	3	16
At risk or with heart/circulation problems	40 (18)	85	10	3	10	0	3	5
Other medical conditions	34 (15)	79	15	15	3	3	6	6
Other miscellaneous reasons	19 (8)	70	4	9	4	4	0	17
Not very physically active	17 (8)	82	12	12	12	6	0	12
Mental health problem	16 (7)	75	13	13	0	6	0	19
Back pain/problems	7 (3)	86	29	0	0	0	29	0

* does not add up to 100% as some people were recommended more than one activity

Appendix 1

Questions specific to this study

Q: QEXR1

In the past 12 months has a health professional (doctor or nurse) recommended that you do some exercise or physical activity or increase your activity level?

1. Yes

2. No

If (ans>1) skip QEXR2

Q: QEXR1b

What type of health professional was this?

1. Nurse

2. Physiotherapist

3. General Practitioner (GP, doctor)

4. Midwife

5. Occupational Therapist

6. Other (please specify)

Q: QEXR1d

How pleased did you feel with being recommended to do some exercise or physical activity or increase your activity level?

1. Not pleased at all

2. Not very pleased

3. Neutral

4. Pleased
5. Very pleased

Q: QEXR1e

What activities were you recommended to do?

1. Gym
2. Swimming
3. Walking
4. Jogging/running
5. A sport such as tennis
6. No particular activity was recommended
7. Other (please specify)

Q: QEXR1f

Were there any other activities you were recommended to do that we did not mention?

Q: QEXR1g

Why were you recommended to do this?

1. Pregnancy
2. Depression or low mood
3. Anxiety
4. Not very physically active

5. Overweight
6. Diabetes
7. At risk of heart problems
8. High blood pressure
9. Other (please specify)

Q: QEXR1i

Did you follow the advice you were given and increase your physical activity?

1. Yes
2. No

Q: QEXR1j

What was the MAIN reason that you did not do this?

1. Didn't think the advice was relevant/appropriate
2. Don't like exercise
3. Didn't have the time
4. Found it too physically difficult
5. Other (please specify)

Q: QEXR2

How pleased would you feel with being recommended to do some exercise or physical activity or increase your activity level by a health professional?

1. Not pleased at all
2. Not very pleased
3. Neutral
4. Pleased
5. Very pleased

APPENDIX 2: Queensland Social Survey 2010 Questionnaire (questions used in this study)

Q: QHD1

Would you say that in general your health is;

- 1 Excellent
- 2 Very good
- 3 Good
- 4 Fair
- 5 Poor

Q: QCORE11

Are you presently a smoker? (i.e. a person who smoked at least one cigarette per day for the past month)

1. Yes
2. No

Q: Qped1

Have you used a pedometer or step counter to count your steps in the last 12 months?

1. Yes
2. No

Physical Activity Measurement Questions: Active Australia Questions

Q: QAAQ1

In the LAST WEEK (emphasize time period), how many times have you walked continuously for recreation or leisure? Only count the times you walked for at least 10 minutes.

Q: QAAQ2

We would like to know, in hours and minutes, how much time you would estimate that you spent walking in this way in the LAST WEEK?

Q: QAAQ3

In the LAST WEEK, how many times did you walk continuously to get to or from places like work, the bus stop, shops or station? Only count times when you walked for more than 10 minutes.

Q: QAAQ4

What do you estimate was the total time that you spent walking in this way in the LAST WEEK?

Q: QAAQ5

In the last week, how many times did you do any VIGOROUS gardening or heavy work around the yard, which made you breathe harder or puff and pant?

Q: QAAQ6

In hours and/or minutes, what do you estimate was the total time that you spent doing VIGOROUS gardening or heavy work around the yard in the last week?

Q: QAAQ7

In the LAST WEEK, how many times did you do any VIGOROUS physical activity that made you breathe harder or puff and pant? (e.g. jogging, cycling, aerobics, competitive tennis).

Q: QAAQ8

In hours and/or minutes, what do you estimate was the total time that you spent doing this VIGOROUS physical activity in the last week?

Q: QAAQ9

In the last week, how many times did you do any other more MODERATE physical activities that you have not already mentioned? (e.g. gentle swimming, social tennis, golf, etc)

Q: QAAQ10

In hours and/or minutes, what do you estimate was the total time that you spent doing these activities in the last week?

Q: QAAQ11

In hours and/or minutes, what do you estimate was the total time that you spent watching TV in the last week?

Q: Qage

What was your age on your last birthday?

Q: Qgender

Record respondent's gender (ask only if necessary)

Q: Qdem2

How tall are you in centimetres?

Q: Qdem3

What is your weight in kilograms?

Q: Qdem8

In which country were you born?

Q: Qdem19

In total how many years of schooling do you have? This includes the total of primary, secondary, technical or tertiary.

Q: Qdem20

Last week, did you have a paid job of any kind?

1 Yes

2 No

Q: Qdem23

Please indicate the level at which you work

1 Manager & administrator

2 Professional

3 Associate/para professional

4 Tradesperson

5 Clerk

6 Salespersons & personal service worker

7 Plant & machine operators, & driver

8 Advanced clerical & service worker

9 Intermediate clerical & service worker

10 Intermediate production & transport worker

11 Elementary clerical, sales & service worker

12 Labourer & related worker

13 Don't know

14 No response

15 Other

Q: Qdem37

Finally, do you presently live in a city, town, or rural area?

1 City

2 Town

3 Rural area