



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

Are doctors and nurses engaging in physical activity and its promotion?

Citation for published version:

Bhandari, S, Watkinson, E & Fawkner, S 2023, 'Are doctors and nurses engaging in physical activity and its promotion?', *British Journal of Nursing*, vol. 32, no. 3, pp. 144-149.
<https://doi.org/10.12968/bjon.2023.32.3.144>

Digital Object Identifier (DOI):

[10.12968/bjon.2023.32.3.144](https://doi.org/10.12968/bjon.2023.32.3.144)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Peer reviewed version

Published In:

British Journal of Nursing

Publisher Rights Statement:

This document is the Accepted Manuscript version of a Published Work that appeared in final form in British Journal of Nursing, copyright © MA Healthcare, after peer review and technical editing by the publisher. To access the final edited and published work see <https://doi.org/10.12968/bjon.2023.32.3.144>.

General rights

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.



Introduction

Physical activity (PA) is beneficial across all aspects of health. It has a pivotal role in preventing and treating a range of non-communicable diseases including obesity, cardiovascular disease, diabetes and cancer. It is also well-documented that PA is a crucial tool in the prevention and management of mental illness (Physical Activity Guidelines Advisory Committee 2018).

The UK PA guidelines for aerobic exercise published in 2019 state that adults (18-64 years) should undertake 150 minutes of moderate intensity PA or 75 minutes of vigorous intensity PA per week (UK Chief Medical Officer 2019). However, a large percentage of adults do not achieve the recommended levels of aerobic PA; 34.1% of adults in England failed to meet the guidelines in 2020-2021 (OHID 2022), and 54% of adults in Scotland in 2020 (Scottish Health Survey 2020).

PA has far broader therapeutic benefits than any pharmaceutical treatment, potentially saving NHS resources and reducing the need to endure medication side-effects (Department of Health 2011). Promoting PA is therefore critical. Healthcare professionals (HCPs) are ideal providers of PA promotion; a large portion of the population have contact with a form of HCP and they are viewed as trusted and respected role models for health advice (Gagliardi et al. 2015).

Despite HCP's key role in combating inactivity, a small body of evidence suggests that PA counselling levels among doctors are low (Adelman et al. 2011; Anis et al. 2004; Barnes & Schoenborn 2012; Smith et al. 2011). Indeed, whilst a recent study reported that 58% of 978 doctors surveyed in Norway were counselling patients on PA (Belfrage et al. 2018), there is no recent data on counselling levels among doctors in the UK. Furthermore, most of the existing

literature focuses on doctors, but nurses are also well-positioned to counsel and may have more contact time with patients (Butler et al. 2018). Limited evidence suggests that PA counselling levels among nurses are more promising than doctors (Buchholz & Purath, 2007; Douglas et al., 2006), however again there is a lack of recent data on this.

Several studies have however investigated HCPs attitudes towards PA counselling; Lobelo and de Quevedo (2016) conducted a systematic review and reported conflicting information as to how important HCPs consider PA counselling in their role; they included a US study of 100 haemodialysis HCPs which reported that 72% of participants did not consider it their responsibility to promote PA (Painter et al. 2004), whereas another US study which included 279 students, faculty and staff at a chiropractic college reported that 76% felt that being a role model for patient education is important (Du Monthier et al. 2009). A UK study of 757 GPs, practice nurses and health visitors reported that 90% of participants agreed that PA promotion is important in primary care (Douglas et al. 2006). Better understanding of the attitudes among doctors and nurses may reveal contributing factors to inadequate counselling.

An association between personal PA habits and counselling practices has previously been established; more active HCPs are more likely to counsel on PA (Belfrage et al. 2018; Holtz et al. 2013; Lobelo & de Quevedo 2016). Assessing if HCPs are meeting PA guidelines is therefore of interest. Research publications from the USA and some European countries indicate that doctors undertake more PA than the general population (Howe et al. 2010; Stanford et al. 2011; Stanford et al. 2013). However, a recent UK study of 245 doctors reported that only 58% of participants were meeting the aerobic PA guideline of 150 minutes of moderate intensity physical activity per week (Crane et al. 2021). Similarly, 56% of nurses in a Canadian study (Lamarche & Vallance 2013) and 53.1% in a UK-based study (Blake &

Harrison 2013) were meeting aerobic PA guidelines. A systematic review concluded that doctors carry out more PA than nurses (Lobelo & de Quevedo 2016), but to date we are not aware of any recent UK study that has compared the PA levels of doctors and nurses.

Various factors relating to a HCP's career may also influence counselling practice, including stage of career and roles. There are conflicting studies evaluating the impact of stage of career on PA counselling; a survey of 326 doctors in San Francisco reported that doctors over the age of 35 years were more likely to counsel on PA than those younger (Walsh et al. 1999), whereas another survey of 4074 primary care physicians found that younger participants felt more confident to counsel (Diehl et al. 2015). Another study evaluated 38 physicians over an 8-week period and identified no effect of age or years in practice on counselling (Anis et al. 2008). Additionally, while the existing research focuses mainly on primary care there is data to suggest that GPs may be more likely to counsel than hospital doctors (Belfrage et al. 2018). There is no equivalent data on role and career stage relating to nurses.

The aim of this study was therefore to evaluate PA levels, attitudes towards PA counselling and counselling practices of UK doctors and nurses.

The research questions were:

- What percentage of UK doctors and nurses meet the UK aerobic PA guidelines?
- How important do UK doctors and nurses consider PA counselling to be as part of their role?
- How often do UK doctors and nurses carry out PA counselling?

- Is personal attainment of the UK aerobic PA guidelines related to attitudes towards counselling and counselling practices?
- Are there differences in attitudes or counselling practices according to graduation year?
- Are there differences in attitudes or counselling practices between doctors and nurses and between primary or secondary care?

METHODS

Study Design

The study included two cross-sectional, anonymised, online surveys (JISC surveys) conducted in 2018/19 (survey 1) and 2019/20 (survey 2). The institution's research ethics committee approved the studies.

Surveys

Both surveys required participants to be English-speaking, a qualified doctor (survey 1 and 2) or nurse (survey 2), over the age of 18 and to consent to participation via an online informed consent process. Both surveys consisted mostly of numerical multiple-choice answers and were split into sections focusing on background, PA habits and counselling practices.

Background data asked questions relating to graduation year, type of doctor or health care professional and role in relation to primary or secondary care.

PA habits were evaluated using the first 2 questions of the Scot-PASQ survey (NHS Health Scotland 2018) and categorised participants into achieving or not achieving the guideline of 150 minutes of aerobic PA each week. Counselling practices were assessed using 2 questions; firstly, participants were asked to estimate the proportion of patients with which they had discussed PA in the past week using a 6-point Likert response (1 = none, 2 = less than 25%, 3

= 25-50%, 4 = 50-75%, 5 = more than 75%, 6 = all patients). Participants were then asked to rate their perceived importance of PA counselling as part of their role on a scale of 1 (not at all important) to 10 (extremely important).

Pilot surveys were carried out to identify errors or misleading questions (n=10 with survey 1 and n=5 with survey 2). No comments were made so the original surveys were used in the final studies. The final surveys consisted of 6 questions and 7 questions respectively (due to an additional question regarding profession in survey 2) and took approximately 3 minutes to complete.

Participant Recruitment

Participants were recruited through social media (Facebook, Twitter) and convenience distribution. Survey 1 was shared on an academic twitter page and survey 2 was distributed with the monthly members email for the Royal College of Physicians and Surgeons of Glasgow. The surveys were open for 11 and 12 weeks respectively.

Data Analysis

The data from both questionnaires were first exported into Microsoft Excel for compiling relevant data and differentiating surveys and healthcare professionals before being analysed using IBM SPSS version 24 Statistics (IBM SPSS Statistics V24.0, IBM Corporation, Armonk, New York).

Descriptive statistics of demographic data and results in each category are presented as numbers and percentages. Chi-square analysis of independence was used to determine if there were significant differences between doctors and nurses in achievement of the PA guidelines. Mann Whitney-U tests were used to determine differences between doctors and nurses for counselling rates, perceived importance of PA counselling and whether counselling practices

differed according to attainment of the guidelines. The same analysis was also used to determine a difference in counselling rates between primary and secondary care. Effect sizes were calculated using the formula $r=Z/\sqrt{N}$. Kruskal Wallis test was used to determine if graduation year effected counselling. Statistical significance was set at $p<0.05$.

Results

A total of 460 doctors and 169 nurses completed the survey. A total of 340 doctors were from survey 1 and 120 doctors and all the nurse responses were from survey 2. Table 1 summarises the study participant demographics.

Over 70% of participants were doctors and the majority of both doctors (78.9%) and nurses (81.7%) who completed the survey worked in secondary care. The majority were professionals graduating between 1991 and 2009 (54.6% of doctors and 53.8% of nurses), although data was distributed throughout the 3 graduation year categories.

Achievement of the UK Physical Activity Guidelines

78.3% of doctors and 73.4% of nurses achieved 150 mins of physical activity in the previous week (table 2). There were no significant differences between the professions in meeting the guidelines, $X^2(1, N= 629) = 1.665, p= 0.197$. Odds ratio 1.306, 95% CI 0.870-1.962.

Perceived importance of PA counselling

The median perceived importance of PA counselling was 8 out of 10 (table 2). There was no significant difference between the professions in the perceived importance of PA counselling (Mdn = 8), $U = 36140, z= -1.370, p=0.171$. Effect size $r= -0.0308$.

PA counselling frequency

PA counselling rates were low, with neither doctors nor nurses counselling more than 50% of their patients (table 3; the highest reported median was 3 which equates to 25-50% of patients). Counselling rates were significantly higher among doctors than nurses (Mdn = 2) $U = 32311$, $z = -3.347$, $p = 0.01$. Effect size $r = -0.1335$.

Furthermore, PA counselling rates were also significantly higher in primary care than secondary care (table 3) (Mdn = 2). $U = 26786$, $z = -2.965$, $p = 0.003$ $r = -0.1200$.

Attainment of guidelines and perceived importance of counselling

There was no difference in perceived importance of counselling between those who did or did not meet the guidelines for both doctors (table 4) (Mdn = 8) $U = 17967$, $z = -0.28$, $p = 0.978$ $r = -0.0131$ and nurses (table 5) (Mdn = 8), $U = 2477$, $z = -1.127$, $p = 0.260$. $r = -0.0867$.

Achievement of the guidelines and counselling practices

There were no differences in level of counselling practices between those who did or did not meet the guidelines for both doctors (table 4) (Mdn = 2) $U = 17399$, $z = -0.528$, $p = 0.598$, $r = -0.0211$ and nurses (Mdn = 2), $U = 2788$, $z = -0.007$, $p = 0.994$, $r = 0.00028$ (table 5).

Graduation Year effect on counselling levels

There was no difference in the level of counselling between graduation years $X^2(10, N = 629) = 8.048$, $p = 0.0624$, (table 3).

Discussion

This study aimed to evaluate PA counselling practices among doctors and nurses, and whether this varies with personal attainment of the UK aerobic PA guidelines, stage of career and

between primary and secondary care. The results from this survey indicate that despite doctors and nurses thinking of PA counselling as an important part of their role, counselling levels in practice are low. Doctors were counselling more patients than nurses, and counselling rates were higher in primary care than secondary care. Graduation year was not implicated as a predictor of perceived importance of PA promotion or counselling levels.

78.3% of doctors and 73.4% of nurses met the UK aerobic PA guidelines. Generally, the level was considerably higher than the general population; 65.9% of adults in England in 2020-2021 (OHID 2022) and 46% of adults in Scotland in 2020 (Scottish Health Survey 2020) met the aerobic PA guidelines. Several studies have similarly reported that doctors in the USA are more active than the general population (Howe et al. 2010; Lobelo & de Quevedo 2016; Stanford et al. 2013). However, the present study is discordant with a recent UK study which reported that only 58% of UK doctors meet the PA guidelines (Crane et al. 2021). Our study also differs from the existing evidence for nurses, with studies reporting that as low as 56% (Lamarche & Vallance 2013) and 53.1% (Blake & Harrison 2013) of nurses were meeting the PA guidelines, the latter of which being a UK-based study. Reasons for this discrepancy are difficult to explain, since all studies have used a similar questionnaire recall approach. Our study population does however indicate that doctors and nurses in the UK are a relatively active cohort.

The existing literature proposes that doctors are more active than nurses; a systematic review by Lobelo and de Quevedo in 2016 including studies based mostly in the USA but also the UK, Canada, Spain, India, Colombia and the Netherlands reported that 45-90% of doctors met the PA guidelines compared to 39-70% of other HCPs (nurses and dietitians). However, none of the studies directly compared doctors and nurses. This is the first study to compare the PA

levels of doctors and nurses in the UK and found there to be no significant difference between the two professions with respect to meeting the aerobic PA guidelines.

Median perceived importance of PA counselling was 8 out of 10. The existing evidence here is conflicting as previously described (Du Monthier et al. 2009; Painter et al. 2004). The present study is concurrent with another UK study which reported that 90% of GPs, practice nurses and health visitors thought that PA promotion was important in primary care (Douglas et al. 2006), indicating that UK HCPs appreciate the importance of PA counselling.

Nonetheless, counselling levels were low at less than 50% for both professions. Several studies have similarly reported inadequate levels of counselling for doctors (Adelman et al. 2011; Anis et al. 2004; Barnes & Schoenborn 2012; Belfrage et al. 2018; Smith et al. 2011). The evidence for nurses is scarcer but supports that counselling levels are low for these HCPs (Buchholz & Purath 2007; Douglas et al. 2006)

This study did however find that doctors discussed PA with significantly more patients than nurses. A previous study of 757 primary care staff reported contradicting findings; health visitors and practice nurses were more likely than general practitioners to offer PA advice (Douglas et al. 2006). Lack of knowledge, lack of time and the topic not being relevant to the setting were identified as barriers to counselling. The ways that these factors may influence doctors and nurses differently requires further exploration.

The existing literature has suggested that there is an association between personal PA habits and PA promotion (Belfrage et al. 2018; Holtz et al. 2013; Lobelo & de Quevedo 2016). Conversely, a single randomised controlled trial of 102 general practitioners found no

correlation between personal PA habits and PA promotion (James et al. 2009). The present study similarly found no association between attainment of the aerobic PA guidelines and perceived importance or level of counselling in either doctors or nurses. More purposeful sampling and larger sample sizes are needed to confirm the relationship between PA levels and counselling among these HCPs.

There are several conflicting studies evaluating the relationship between stage of career and PA promotion (Anis et al. 2004; Diehl et al. 2015; Walsh et al. 1999). The present study identified no link between graduation year and perceived importance of PA promotion or level of counselling. It has been theorised that improvements to training curricula better equip more recent graduates to counsel on PA, but it is possible that despite this, education remains inadequate (Diehl et al. 2015). Indeed, in a survey of 148 nurse practitioners, 63% of participants stated that their training included no formal preventative medicine teaching (Lamarche & Vallance 2013). Comparatively, a study of 395 medical students at Edinburgh Medical School reported that less than 10% of participants felt adequately trained to counsel on PA (Osborne et al. 2016). The scarcity of training in PA promotion in medical school curricula necessitates intervention to improve confidence and competence in counselling (Gates 2015).

Counselling rates were significantly higher in primary care than secondary care in this study. This is concurrent with the findings of Belfrage et al. (2018); they surveyed 526 doctors and found that GPs were more likely to counsel than hospital doctors. An interview-based study of 11 UK junior doctors explored attitudes surrounding this; a theme that emerged from discussion was that the participants considered PA counselling for disease prevention the role of GPs and saw the main focus of secondary care as treating the presenting problem rather than

addressing the cause (Osinaike & Hartley 2021). Recognising the role of PA in management as well as prevention could improve attitudes towards PA counselling in the hospital setting.

Limitations:

This is one of the largest studies comparing PA habits and counselling practices of different healthcare professionals and therefore the findings provide a useful insight into this area. However, there are limitations. The voluntary nature of the survey and the use of social media for recruitment may have resulted in self-selection bias and also excluded doctors and nurses who were not users of social media, thus resulting in inaccurate population representation. Furthermore, the use of a survey carries the inherent risk of self-report bias; socially desirable responding could have given rise to higher reported rates of PA and counselling than actual levels.

This study's small sample size of 629 may have resulted in statistically insignificant findings, thus failing to identify true correlations in the data. Additionally, 460 doctors but only 169 nurses participated, challenging the validity of comparisons between the groups.

PA level was assessed using questions from the Scot-PASQ which is a well-established tool (NHS Health Scotland 2018). However, it was not designed for use in this study and therefore may have lacked the necessary detail for comparing PA habits. Furthermore, new UK PA guidelines were launched in September 2019, and the ScotPASQ was updated. The ScotPASQ now includes explicit reference to the possible contribution of vigorous intensity activity to achieving the aerobic PA guideline, which is not included in the original ScotPASQ questions. As well, the publicity associated with the launch of the new guidelines may have increased

awareness of the guidelines among the second cohort and thus impacted their PA levels or reporting bias.

Future direction:

As one of the earliest studies comparing PA counselling between doctors and nurses, future research on a larger scale is indicated to better understand the trends reported. As the majority of the existing studies are survey-based, there is a need to utilise different methods to more objectively quantify PA levels and counselling rates.

More detailed assessment of PA habits could reveal more about the effect on counselling practices. Additionally, evaluating the impact counselling has on patient behaviour is needed to determine its efficacy and inform educational interventions for healthcare professionals.

Conclusion:

This study aimed to evaluate aerobic PA levels, attitudes to counselling and counselling practices of doctors and nurses and variation with stage of career and between primary and secondary care. We found that both doctors and nurses are more active than the general population but despite this PA counselling levels are low; this is concordant with the existing evidence in this area. Counselling rates were higher in doctors compared with nurses and in primary care compared with secondary care but stage of career had no impact on counselling levels. These conclusions are not so well-established in the literature and thus further evidence

is needed. Further research into educational interventions and effective counselling methods may help to fight inactivity and reduce its widespread burden.

References

1. Adelman RD, Greene MG, Friedmann E, Ory MG, Snow CE. 2011. Older patient-physician discussions about exercise. *J Aging Phys Act.* 19(3):225-238.
2. Anis NA, Lee RE, Ellerbeck EF, Nazir N, Greiner KA, Ahluwalia JS. 2004. Direct observation of physician counseling on dietary habits and exercise: Patient, physician, and office correlates. *Prev Med.* 38(2):198-202.
3. Barnes PM, Schoenborn CA. 2012. Trends in adults receiving a recommendation for exercise or other physical activity from a physician or other health professional. *NCHS Data Brief.* (86):1-8.
4. Belfrage ASV, Grotmol KS, Tyssen R, Moum T, Finset A, Isaksson Ro K, Lien L. 2018. Factors influencing doctors' counselling on patients' lifestyle habits: A cohort study. *BJGP Open.* 2(3):bjgpopen18X101607.
5. Blake H, Harrison C. 2013. Health behaviours and attitudes towards being role models. *Br J Nurs.* 22(2):86-94.

6. Buchholz SW, Purath J. 2007. Physical activity and physical fitness counselling patterns of adult nurse practitioners. *J Am Acad Nurse Pract.* 19(2):86-92.
7. Butler R, Monsalve M, Thomas GW, Herman T, Segre AM, Polgreen PM, Suneja M. 2018. Estimating time physicians and other health care workers spend with patients in an intensive care unit using a sensor network. *Am J Med.* 131(8):972 e979-972 e915.
8. Crane E, Schaller G, Bergström M, Leivadiotou D, Simpson A. 2021. How active are uk-based doctors? *The Bulletin of the Royal College of Surgeons of England.* 103:139-143.
9. Department of Health. Health matters: physical activity - prevention and management of long-term conditions. 2020. GOV.UK. [accessed 2021 May 20]. <https://www.gov.uk/government/publications/health-matters-physical-activity/health-matters-physical-activity-prevention-and-management-of-long-term-conditions>.
10. Diehl K, Mayer M, Mayer F, Gorig T, Bock C, Herr RM, Schneider S. 2015. Physical activity counseling by primary care physicians: Attitudes, knowledge, implementation, and perceived success. *J Phys Act Health.* 12(2):216-223.
11. Douglas F, Torrance N, van Teijlingen E, Meloni S, Kerr A. 2006. Primary care staff's views and experiences related to routinely advising patients about physical activity. A questionnaire survey. *BMC Public Health.* 6:138.

12. DuMonthier WN, Haneline MT, Smith M. 2009. Survey of health attitudes and behaviors of a chiropractic college population. *J Manipulative Physiol Ther.* 32(6):477-484.
13. Gagliardi AR, Abdallah F, Faulkner G, Ciliska D, Hicks A. 2015. Factors contributing to the effectiveness of physical activity counselling in primary care: A realist systematic review. *Patient Educ Couns.* 98(4):412-419.
14. Gates AB. 2015. Training tomorrow's doctors, in exercise medicine, for tomorrow's patients. *Br J Sports Med.* 49(4):207-208.
15. Holtz KA, Kokotilo KJ, Fitzgerald BE, Frank E. 2013. Exercise behaviour and attitudes among fourth-year medical students at the university of british columbia. *Can Fam Physician.* 59(1):e26-32.
16. Howe M, Leidel A, Krishnan SM, Weber A, Rubenfire M, Jackson EA. 2010. Patient-related diet and exercise counseling: Do providers' own lifestyle habits matter? *Prev Cardiol.* 13(4):180-185.
17. James I, Smith A, Smith T, Kirby E, Press P, Doherty P. 2009. Randomized controlled trial of effectiveness of pedometers on general practitioners' attitudes to engagement in and promotion of physical activity. *J Sports Sci.* 27(7):753-758.

18. Lamarche K, Vallance J. 2013. Prescription for physical activity a survey of canadian nurse practitioners. *Can Nurse*. 109(8):22-26.
19. Lobelo F, de Quevedo IG. 2016. The evidence in support of physicians and health care providers as physical activity role models. *Am J Lifestyle Med*. 10(1):36-52.
20. OHID O. 2022. Physical Activity - Data - OHID. [Fingertips.phe.org.uk](https://fingertips.phe.org.uk). [accessed 2022 Jul 22]. <https://fingertips.phe.org.uk/profile/physical-activity/data#page/1/gid/1938132899/ati/15/iid/93014/age/298/sex/4/cat/-1/ctp/-1/yr/1/cid/4/tbm/1/page-options/car-d>
21. Osborne S, Adams J, Fawkner S, Kelly P, Murray A, Oliver C. 2016. Tomorrow's doctors want more teaching and training on physical activity for health. *British Journal of Sports Medicine* 51:624.2-625.
22. Osinaike J, Hartley SE. 2021. Physical activity counselling among junior doctors in the uk: A qualitative study. *Health Education Journal*. 80(5):584-595.
23. Painter P, Carlson L, Carey S, Myll J, Paul S. 2004. Determinants of exercise encouragement practices in hemodialysis staff. *Nephrol Nurs J*. 31(1):67-74.
24. Physical Activity Guidelines Advisory Committee. *2018 physical activity guidelines Advisory Committee scientific report*. US Department of Health and Human Services, Washington, DC: US.
25. Scottish Health Survey 2020 - volume 1: main report. 2022. [Gov.scot](https://www.gov.scot). [accessed 2022 July 23]. <https://www.gov.scot/publications/scottish-health-survey-telephone-survey-august-september-2020-main-report/pages/9/>
26. Smith AW, Borowski LA, Liu B, Galuska DA, Signore C, Klabunde C, Huang TT, Krebs-Smith SM, Frank E, Pronk N et al. 2011. U.S. Primary care

physicians' diet-, physical activity-, and weight-related care of adult patients.
Am J Prev Med. 41(1):33-42.

27. Stanford F, Durkin M, Blair S, Powell C, Poston M, Stallworth J. 2011. Determining levels of physical activity in attending physicians, resident and fellow physicians and medical students in the USA. British Journal of Sports Medicine 46:360-364.
28. Stanford FC, Durkin MW, Stallworth JR, Blair SN. 2013. Comparison of physical activity levels in physicians and medical students with the general adult population of the united states. Phys Sportsmed. 41(4):86-92.
29. UK Chief Medical Officer. 2019. UK Chief Medical Officer's Physical Activity Guidelines. Department of Health and Social Care.
30. Walsh J. 1999. Exercise counselling by primary care physicians in the era of managed care. American Journal of Preventive Medicine 16:307-313.

Tables and Figures

Table 1: Study participant demographics

Profession	Number	Primary Care (General practice)	Secondary care (hospital)	Graduation year before 1991	Graduation year between 1991 - 2009	Graduation after 2009
Doctor	460	97	363	142	251	67
Nurse	169	30	138	48	91	30
Total	629	127	501	190	342	97

Table 2: Achievement of aerobic guidelines, perceived importance of counselling and level of counselling

Profession	Percentage who achieve the aerobic guidelines	Importance of PA counselling	Level of counselling
Doctors	78.3%	8.00 (3)	2.00 (1)
Nurses	73.4%	8.00 (3)	2.00 (2)

Values are medians (IQR)

Table 3: Levels of counselling in the primary and secondary care setting and year of graduation

	Primary care (IQR)	Secondary care (IQR)	Primary and secondary Care (IQR)	Grad year before 1991 median (IQR)	Grad year between 1991-2009 (IQR)	Grad year after 2009 (IQR)
Doctors	3.00* (1)	2.00* (2)	2.00 (1)	2.00 (2)	2.00 (1)	2.00 (1)
Nurses	3.00* (2)	2.00* (2)	2.00 (2)	2.00 (2)	2.00 (3)	2.00 (2)
Both	3.00 * (1)	2.00* (2)	2.00 (1)	2.00 (1)	2.00 (1)	2.00 (2)

Values are medians (IQR); * significant difference between primary and secondary care and doctors and nurses in counselling rates (P<0.05).

Table 4: Levels of counselling and counselling importance in doctors who did and did not meet the aerobic PA guideline

Doctors	Level of counselling	Perceived Importance of counselling
Met guidelines	2.00 (1)	8.00 (5)
Did not meet GL	2.00 (2)	8.00 (3)

Values are medians (IQR)

Table 5: Levels of counselling and counselling importance in nurses who did and did not meet the aerobic PA guideline

Nurses	Level of counselling	Perceived Importance of Counselling
Met guidelines	2.00 (2)	8.00 (5)
Did not meet GL	2.00 (2)	7.00 (5)

Values are medians (IQR)