Exploring sedentary behaviour among general practitioners

SHORT REPORT

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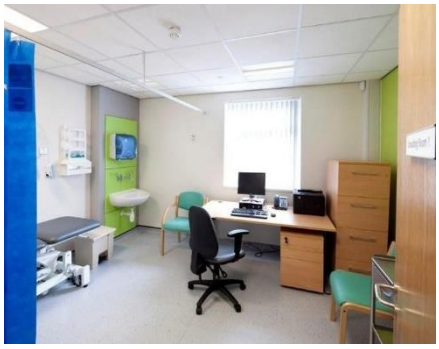

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Evidence Brief

Background:

Excessive sedentary behaviour is associated with adverse health outcomes and increased all-cause mortality. Sedentary behaviour among GPs may have increased since the onset the COVID-19 pandemic due to higher uptake of telemedicine, traditionally performed while sitting down. It has previously been shown that GPs who are more physically active are more likely to recommend physical activity to their patients. Patients are also more likely to follow the advice of their clinician if they believe their clinician follows the advice themselves. There has been minimal previous research regarding sedentary behaviour among GPs. For this reason, we explored levels of sedentary behaviour among GPs and General Practice Specialty Trainees (GPSTs), as well as barriers and facilitators to them reducing their sedentary behaviour and increasing their physical activity.

Methods:

We conducted an online questionnaire and thigh-worn accelerometer sub-study of GPs and GPSTs in Northern Ireland. Self-reported questionnaire data were aggregated and compared with device-measured accelerometry data. We subsequently undertook 13 semi-structured interviews with GPs and GPSTs to explore barriers and facilitators to them reducing their sedentary behaviour and increasing their physical activity.

Findings:

Doctors in general practice self-reported higher workday sedentary time (10.33 (SD=2.97) hours) than those in secondary care (7.9 (SD=3.43) hours) (MD 2.43 hours; $p<0.001$). An active workstation, such as a standing desk, was used by 5.6% of participants in general practice, while 86.0% of those without one would consider using one in future. Those with active workstations self-reported lower workday sedentary time (7.88 (SD=3.2) hours) than those without (10.47 (SD=2.88) hours) (MD -2.58 hours, $p=0.001$). Accelerometer sub-study participants underestimated their workday sedentary time by 0.17 hours (95% CI -1.86, 2.20; $p=0.865$), and non-workday sedentary time by 2.67 hours (95% CI 0.99, 4.35; $p=0.003$). Most GPs (80.7%) reported increased workday sedentary time compared to prior to the COVID-19 pandemic, while 87.0% would prefer less workday sedentary time.

Key themes from semi-structured interviews were categorised within six theoretical domains within the theoretical domains framework, with sub-themes within each domain. Relevant domains included: environmental context and resources; social professional role and identity; behavioural regulation; social influences; knowledge; intentions.

Practice and policy implications and recommendations:

GPs have high levels of workday sedentary time, which may be detrimental to their health. It is imperative to develop methods to address sedentary behaviour among GPs on workdays, both for their own health and the health of their patients.

Background:

Sedentary behaviour is defined as time spent sitting, lying or reclining, in a state of low energy expenditure, whilst awake. Excessive sedentary behaviour is associated with adverse health outcomes, including type II diabetes mellitus, obesity, cardiovascular disease, metabolic syndrome, dementia, certain cancers, mental health issues and increased all-cause mortality. The World Health Organisation therefore advises individuals to minimise and break up periods of sedentary behaviour.

Primary care is "the cornerstone" of the UK NHS, providing over 300 million patient consultations per year. By virtue of their position in the healthcare system, GPs can provide evidence-based lifestyle guidance to patients, which can play an important role in primary and secondary prevention of many illnesses. Despite this, guidance from GPs to their patients about physical activity is often poor. GPs who are more physically active are more likely to recommend physical activity to their patients. Patients are more likely to make healthy lifestyle changes if they believe their doctor follows the guidance themselves. Reducing sedentary behaviour and increasing physical activity among GPs could potentially lead to health benefits for GPs and their patients. This is particularly relevant now that GPs are performing more remote consultations, traditionally performed while sitting down. It is therefore important to investigate current levels of sedentary behaviour among GPs, as well as explore barriers and facilitators to them reducing their sedentary behaviour and increasing their physical activity, as encouraging GPs to sit less and move more could potentially lead to health benefits for both GPs and their patients.

Aims and Objectives:

Study 1) Questionnaire and accelerometer study

The specific objectives of the questionnaire and acclerometer study were:

- To quantify levels of sedentary behaviour on a typical workday and non-workday;
- To identify differences in the levels of sedentary behaviour depending on work environment, age and gender;
- To establish current uptake of "active workstations" such as standing desks;
- To ascertain if sedentary behaviour has been affected by changes due to the COVID-19 pandemic.

Study 2) Qualitative Interview Study

The specific objectives of the qualitative interview study were to explore GPs' perspectives regarding:

- Their knowledge of health outcomes related to physical inactivity and sedentary behaviour;
- Their own physical activity and sedentary behaviour;
- Workplace interventions to reduce sedentary behaviour and increase physical activity;
- How their own lifestyle choices affect their interactions with patients.

Methods

Study 1) Questionnaire and accelerometer study:

Overall design:

A cross-sectional study was conducted in accordance with STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) guidance, following a sequential design, incorporating an online questionnaire survey and subsequent accelerometer sub-study.

Stage 1: Online questionnaire study:

Design and distribution:

A questionnaire was distributed to GPs and GPSTs throughout Northern Ireland using email and social media. GPs and GPSTs in Northern Ireland have similar working conditions to their contemporaries throughout the rest of the UK. The International Sedentary Assessment Tool (ISAT) was used; a multi-item questionnaire developed following a systematic review of sedentary behaviour questionnaires. Participants were recruited voluntarily, with no obligations or rewards for taking part. The Faculty of Medicine, Health and Life Sciences Research Ethics Committee of Queen's University Belfast approved the study (reference MHLS20_39). All participants provided informed consent. The questionnaire was live between 28 August and 24 September 2020.

Inclusion/Exclusion criteria:

Inclusion criteria were: being a GP partner, salaried GP, sessional/locum GP or GPST working in Northern Ireland at the time of the study. Exclusion criteria were: answering a question that contradicted the inclusion criteria.

Analysis:

Statistical analyses were conducted using SPSS (V.25.0). Baseline characteristics were described using mean (SD) for numerical data and counts (%) for categorical data. The distribution of numerical data was assessed visually using histograms and QQ plots. Data were analysed using independent t-tests and chi-square tests where appropriate. All tests were 2-sided with statistical significance set at $p<0.05$.

Stage 2: Accelerometer sub-study:

Recruitment and data collection:

Twenty questionnaire respondents were recruited to the accelerometer sub-study, using purposive sampling to ensure maximum variation based on their demographic criteria (age, gender, work pattern/environment) and self-reported sedentary time. During autumn 2020, participants were posted an Axivity AX3 accelerometer, adhesive waterproof dressings, and instructions. Axivity AX3 accelerometers are valid for accurately identifying sedentary time. Participants were instructed to wear the accelerometer continuously, on the middle of the thigh, over a seven-day period while completing a contemporaneous sleep/work log. On completion, participants posted back the accelerometer and sleep/work log.

Inclusion/Exclusion criteria:

Inclusion criteria were: being a GP partner, salaried GP, sessional/locum GP or GPST working in general practice in Northern Ireland at the time of the study; having completed the online sedentary behaviour questionnaire; having consented to being approached for a subsequent accelerometer sub-study. Exclusion criteria were: not meeting the inclusion criteria; having a comorbidity that the participant felt would affect sedentary time; being on annual leave during the study; undertaking contact sports that could damage the accelerometer.

Analysis:

Accelerometers were programmed to capture triaxial accelerations at 50Hz with a dynamic range of +/- 8g. Details on accelerometer data processing and analysis can be found in a previous study [20]. For inclusion in the final analysis, accelerometers needed to be worn for a minimum of one valid workday and one valid non-workday. A valid day required a minimum of 600 minutes of wear-time whilst awake, as required for previous accelerometer studies. A valid workday required the participant to work at least one clinical session. Accelerometer data was used to determine sedentary time, step count and time spent during light (LPA) and moderate-to-vigorous (MVPA) physical activity.

Study 2) Qualitative Interview Study

Design:

In autumn 2020 an online questionnaire, based on the International Sedentary Assessment Tool (ISAT), was distributed to GPs and GPSTs throughout Northern Ireland using email and social media. In addition to information regarding demographics, work environments and work patterns, participants were asked to self-report their sedentary time on a typical workday and non-workday. Participants were recruited voluntarily, with no obligations or rewards for taking part. The Faculty of Medicine, Health and Life Sciences Research Ethics Committee of Queen's University Belfast approved the study (reference MHLS20_39). All participants provided informed consent. Among the 353 participants who accessed the questionnaire, 196 supplied their contact details to indicate they were willing to participate in a subsequent accelerometer and interview sub-study. A purposive sample of 20 participants were recruited to the accelerometer and interview sub-study to ensure maximal variation based on age, sex, work pattern/environment, access to an active workstation and self-reported sedentary time. These participants were supplied with an accelerometer (a device validated for the detection of sitting, lying, standing and light, moderate and vigorous physical activity) to wear continuously, on the middle of the thigh, over a seven-day period while completing a contemporaneous sleep/work log. They were subsequently approached to arrange an interview, during which they were informed of their results from the accelerometer sub-study and asked questions about their views on physical activity and sedentary behaviour.

Data collection:

One male researcher, with previous experience in qualitative research, conducted in-depth semi-structured interviews over webcam with ten GPs and three General Practice Specialty Trainees (GPSTs), comprising nine females and four males, during May and June 2021. Participants had between one and 27 years of experience working in general practice. Three participants had experience of using active workstations in general practice, while ten did not. Participants had ranged between 7.85 and 12.47 hours of average workday sedentary time during the preceding accelerometer sub-study. The interview guide had previously been piloted and minor revisions were

made to the questions after the first two interviews had been conducted. All participants had previously provided informed consent. Interviews lasted between 21 and 32 minutes in duration. Saturation of the main themes was reached after the 12th interview, however a further interview was conducted to maximise participant diversity.

Analysis:

Interviews were recorded digitally and transcribed verbatim by the interviewer (RSM). Transcripts were coded within NVivo (version 12), using reflexive thematic analysis to map viewpoints relating to GP sedentary behaviour and physical activity behaviour change onto relevant domains from the Theoretical Domains Framework (TDF). The TDF was developed to investigate determinants of behaviour and inform the choice of potential strategies for behaviour change interventions. This study used the second version of the TDF, which was created after validation of the original TDF, and comprises 14 domains covering 84 theoretical constructs including social, environmental, cognitive, and affective components. Further inductive analysis was undertaken to create explanatory sub-themes within the previously identified domains within the TDF. Independent analysis of a random sample of three interviews was initially undertaken by a second researcher (NH). Differences in coding were discussed before a consensus was reached to ensure appropriateness of domain mapping and creation of sub-themes.

Personal and Public Involvement (PPI):

Engagement with GPs, GPSTs and other general practice staff was undertaken throughout the course of the research, to inform study design and ensure relevance of research.

Findings

Study 1) Questionnaire and accelerometer study:

Online questionnaire:

Sample Characteristics:

There were 1999 GPs and GPSTs working in Northern Ireland at the time of the study; 1633 GPs and 366 GPSTs. The online survey was accessed by 353 people, 17.7% of the eligible population. Average age was 39.9 (SD=0.3) years, with 61.7% (n=204) female. GPs comprised 74.2% (n=251), with the rest GPSTs. GPs and GPSTs in general practice at the time of the study comprised 92.0% (n=312), with an average age of 40.7 (SD=10.2) years. The remainder, all GPSTs, with an average age of 32.5 (SD=7.7) years, were working in secondary care settings. GPs reported working an average of 6.09 (SD=1.75) clinical sessions per week in general practice, while 75.6% of GPSTs were working full time, with the remainder working part-time.

Self-reported sedentary time:

Overall, participants reported more sedentary time on workdays (10.33, SD=2.97 hours) than non-workdays (4.78, SD=3.02 hours) (MD 5.55 hours; 95% CI 5.08, 6.02; $p<0.001$). Participants in general practice reported more workday sedentary time (10.33, SD=2.97 hours) than those in secondary care (7.9, SD=3.43 hours) (MD 2.43 hours; 95% CI 1.2, 3.37; $p<0.001$). However, participants in general practice reported less sedentary time on non-workdays (4.78, SD=3.02 hours), than those in secondary care settings (6.17, SD=3.67 hours) (MD 1.38 hours; 95% CI 0.17, 2.60; $p=0.025$).

Access to active workstations:

Among participants in general practice, 5.6% (n=18) reported having access to an active workstation, such as a standing desk, at work. They reported lower workday sedentary time (p<0.001) than those who did not have access to an active workstation (7.88 (SD=3.20) hours vs 10.47, (SD=2.88) hours). Participants in general practice with active workstations had similar levels of workday sedentary time to participants working in secondary care settings (MD 0.02 hours; 95% CI -2.10, 2.06; p=0.985).

Attitudes regarding active workstations:

Among participants in general practice without active workstations, 86.0% (n=253) would consider using one in future. Participants who would consider using an active workstation were younger (40.2, SD=9.7 years vs 45.3, SD=12.1 years; p=0.019) than those who would not.

Attitudes regarding sedentary behaviour:

Among participants in general practice, 87.0% (n=274) reported they would prefer less time sitting, 11.9% (n=38) would prefer the same time sitting and 1.1% (n=3) would prefer more time sitting on a typical workday. Those who would prefer less time sitting had more (p<0.001) workday sedentary time (10.68, SD=2.70 hours) than those who would prefer the same time sitting (7.93, SD=3.45 hours).

Changes in sedentary behaviour due to COVID-19 pandemic:

Among participants in general practice, 80.7% (n=255) reported spending more time sitting, 3.9% (n=44) the same time sitting and 5.4% (n=17) less time sitting at work than prior to the COVID-19 pandemic.

Accelerometer sub-study:

Sample demographics:

Data capture and analysis:

All accelerometers and sleep/work logs were returned to the investigators. Not all participants wore accelerometers during the study period: two forgot to wear the device; one was unable to affix the device to their thigh. Therefore, 17 participants provided usable accelerometer data to analyse.

Comparison of accelerometer and self-reported data:

Two participants who wore the accelerometer were excluded from the analysis. They did not work in general practice because of illness during the study. Objective, accelerometer data were compared with subjective, self-reported data for the remaining 15 participants. Average self-reported workday sedentary time was 9.83 (SD=3.45) hours. Their average accelerometry-measured workday sedentary time was 10.00 (SD=1.69) hours, showing they had slightly underestimated their overall workday sedentary time by 0.17 hours (p=0.865). Average non-workday self-reported sedentary time was 4.53 (SD 2.55) hours. Their average accelerometry-measured overall non-workday sedentary time was 7.20 (SD 1.88) hours, showing they had significantly underestimated their overall non-workday sedentary time by 2.67 hours (p=0.003).

Active workstations:

Participants with active workstations had less workday sedentary time (p<0.001) than those without active workstations (7.57 (SD=0.56) vs 10.88 (SD=0.82) hours). They also had more (p<0.001) workday standing time (5.81 (SD 1.39) vs 2.88 (SD 0.79) hours). There was no significant difference in average workday LPA, MVPA and step counts between participants with and without active workstations.

Workdays vs Non-workdays:

Sedentary time was higher (10.00 (SD=1.69) vs 7.20 (SD=1.88) hours (p<0.001)) on workdays than non-workdays. LPA (3.36 (SD=0.86) vs (4.26 (SD=1.26) hours (p=0.030)), MVPA (0.36 (SD=0.29) vs (1.02 (SD=0.41) hours (p<0.001)) and step counts (5281.51 (SD=2690.17) vs 10890.89 (SD=4063.56) (p<0.001) were lower on workdays than non-workdays. There was no significant difference in standing time on workdays and non-workdays.

Study 2) Qualitative Interview Study

Key themes emerging from the interviews were categorised within six theoretical domains from the theoretical domains framework, with sub-themes within each domain.

Environmental context and resources:

Participants identified workload as a key barrier to reducing sedentary behaviour and increasing physical activity.

"It's probably workload, obviously. The practice closes one to two, so really there shouldn't be anybody turning up. Like there's no need for a GP to be in the building for that time. But there's always paperwork, blood results, overdue phone calls that need done…" GP102, female.

Climate and seasonality affected willingness of participants to engage in physical activity.

"I guess during winter time I find it very difficult to get up in the morning in the ice and the cold to get out for any sort of exercise." GP109, female.

Physical surroundings, such as the built and natural environment in and around the workplace influenced the opportunities for physical activity.

"You're tied to the phone and you're tied to your computer. And that does involve, you know, sitting a lot and we've a very small area in the practice. It's a really tiny practice, so we don't have long corridors or stairs or anything like that." GP108, female.

Telemedicine was identified by many participants to be a cause of excessive sedentary time, however some recognised the possibility of telemedicine to allow an increase in physical activity.

"*Prior to the pandemic, prior to doing telephone triage, I would have walked, I'm not going to pretend it was much, but it would have been a bit more because we didn't, you know, we would have gone out and called patients. At least you got up. Whereas on the telephone you just literally sit in your chair and that's you, you know, for three hours solid and then you see the three or four patients you have booked in, so there's very little opportunity for activity at all in the workplace. But I don't know how you change that."* GP112, female.

Social professional role and identity:

Participants self-perceived professional roles and responsibilities influenced their perception of their abilities to make changes to their sedentary behaviour and physical activity.

"It's a whole cultural thing, isn't it? But I, we can start. We can start somewhere as a practice... We shouldn't need to wait from on high to be told what everyone's going to do. We should make a start, you know. But yeah, I guess it's just that we get so bogged down with the day-to-day work, don't we? And we just we neglect ourselves." GP106, female.

Personal roles and responsibilities were also important factors.

"Young kids don't make it easy. You know there's always other things to pull away your time." GP102, female.

All participants felt that their own lifestyle choices affected their ability to effectively counsel patients regarding health behaviours, however the importance of this varied between participants.

"At the end of the day, you're trying to promote. And how do you promote a healthy lifestyle? By actually trying to lead a similar healthy lifestyle and I think that that is evident from somebody who's sitting in front of you. It's how you approach people and be open and try to adapt, sort of a general good lifestyle. Because it's going to maybe help somebody. So not everything works for everybody, so you have to try and find common ground with them, so it's how you communicate with people." GP 118, female.

Behavioural regulation:

The importance of self-monitoring and action planning were recognised by many participants.

"We had a practice step challenge to see who could get the most number of steps in a day. I did that for a while but I was thoroughly depressed because I had a very, very low (number of steps). GP110, male.

Some participants deemed that prioritising physical activity was essential for physical and mental wellbeing.

"I think the biggest issue in modern life limiting exercise would be people saying that they're too busy. But I mean, you know, clearly we are busy people. And if we can't afford three mornings a week or whatever it is to get out and get a run, or whatever your exercise is, I think it's just so important for your physical and mental health, and I think it shows. It shows to others that no matter how busy you are, you can fit something in or prioritise it. It's about priorities." GP109, female.

Social influences:

Colleagues provided both positive and negative influences on the likelihood of participants to engage in behaviours to reduce their sedentary behaviour and increase their physical activity.

"I probably thought I'll get mocked by my partners for having a standing desk 'cause I'm always trying to come up with new ideas." GP111, male.

Patient and public perceptions were also important for participants.

"I know that when the reception staff go in even to (the supermarket) to buy some lunch they've been, you know, like verbally abused by patients for being out when they can't get appointments, you know, or when they can't get through to the practice. So that has been in my mind, but where I'm working at the moment is a big enough place and the practice has four times the number of patients my last practice did, so it's a bit easier to be anonymous." GP113, male.

Knowledge:

All participants had good understanding and awareness of health risks related to physical inactivity and sedentary behaviour.

"Well it's the usual… weight gain, diabetes, heart, blood pressure… problems with your joints. Stress probably as well. Mental health. Yeah, everything." GP106, female.

Despite this, awareness of interventions and initiatives to increase physical activity among general practice staff was mixed. Ten participants (76.9%) were aware of the parkrun practice initiative [20], but only one participant (7.7%) had heard of the RCGP Active Practice Charter [21]. Some participants were also sceptical about the effectiveness of these interventions and initiatives.

"And I know that there's like parkrun for GP surgeries on Saturdays… but I don't think for me a parkrun on a Saturday is going to outdo the Monday to Friday concerns." GP109, female.

Intentions:

Regarding physical activity behaviours, the intentions of all participants could be mapped onto the stages of change model, which ranges from precontemplation, through to contemplation, preparation, action and maintenance [22].

GP119, female, was in the contemplation stage.

"I probably feel like I'm not as active as I should be, probably. I think the NHS recommend 150 minutes, well I don't know, 150 minutes per week of light to moderate exercise and then over 70 minutes of vigorous whereas I kind of feel like. I mean I just go for a few walks, but other than that don't do any other physical activities like running or cycling or sport at the moment. So I feel like I could definitely improve on that."

GP113, male, was in the maintenance stage.

"I just make sure… throughout the morning, I'll periodically take my scripts through. So I make a point, maybe after every four or five patients of just getting up, putting the headset off and walking away from my desk just to make sure that I stand up and maybe force myself to take a bathroom break every at least every 10 patients as well."

Conclusion

Study 1) Questionnaire and accelerometer study:

This study demonstrates that doctors working in general practice typically have high levels of sedentary time on workdays, with much less on non-workdays. Workday sedentary time among GPs

has generally increased since the onset of the COVID-19 pandemic. It is therefore important to consider ways of reducing workday sedentary time among GPs, given the negative health effects of excessive sedentariness and the role of GPs in counselling patients about healthy lifestyles.

Study 2) Qualitative Interview Study:

This study demonstrates that GPs have good awareness of the negative health consequences of excessive sedentary behaviour and physical inactivity and that most GPs are unhappy with their current levels of sedentary behaviour and physical activity.

Practice and Policy Implications/Recommendations

Now that numerous barriers and facilitators to GPs increasing their physical activity have been identified, further research should assess the acceptability of multicomponent interventions aimed at encouraging GPs to be less sedentary and more physically active throughout the working day, as well as how this affects their interactions with patients.

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