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Are general practitioners sitting too comfortably? Exploring sedentary behaviour among general practitioners

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Are general practitioners sitting too comfortably?

Exploring sedentary behaviour among general practitioners



Presented to Queen's University Belfast for the degree of Doctor of Medicine, School of
Medicine, Dentistry and Biomedical Science

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November 2023

Declaration

I hereby declare that:

- 1) This thesis is not one for which a degree has been or will be conferred by any other university or institution.
- 2) This thesis is not one for which a degree has already being conferred by this university.
- 3) The composition of this thesis is my own work.

Dr Richard S. Mayne

Summary abstract

Introduction

Sedentary behaviour is associated with many adverse health outcomes and increased all-cause mortality. There is a lack of prior evidence regarding sedentary behaviour among general practitioners (GPs).

Aims

To gather evidence regarding levels of sedentary behaviour among GPs. This thesis describes a systematic review of the literature, cross-sectional quantitative research to identify current levels of sedentary behaviour among GPs, qualitative research exploring GPs' perspectives regarding their movement behaviours, and a feasibility study exploring the relationship between GP movement behaviours and their levels of burnout and fatigue.

Method

A systematic literature review was undertaken to identify and synthesise previous evidence regarding sedentary behaviour among GPs. A mixed-methods study was then conducted to gain current evidence regarding sedentary behaviour among GPs. This involved an initial sedentary behaviour questionnaire study, which was followed by thigh-worn accelerometer and semi-structured interview studies. A further study explored the relationship between GP movement behaviours with burnout and fatigue, using a questionnaire and simultaneous thigh-worn accelerometer monitoring, to assess the feasibility of conducting an intervention study aiming to reduce GP burnout by improving their movement behaviours.

Results

Systematic review

Only 2 studies were identified which reported sedentary behaviour among GPs. Both were cross-sectional surveys using self-reported estimation of sedentary time, using just one question within the International Physical Activity Questionnaire (IPAQ). Both studies were of satisfactory methodological quality but had a high risk of bias, and both were conducted prior to the COVID-19 pandemic.

Questionnaire study

Data from 353 participants (17.7% of GPs and GPSTs in Northern Ireland) revealed doctors working in general practice self-reported higher workday sedentary time than those in secondary care, and similar amounts of sedentary time to people working in administration and telecommunication sectors. An active workstation (for example, sit-stand desk) was used by 5.6% of participants in general practice, while 86.0% of those without one would consider using one in future. Active workstation users self-reported lower workday sedentary time than non-users. Most GPs (80.7%) reported increased workday sitting time compared to prior to the COVID-19 pandemic, while 87.0% would prefer less workday sitting time.

Accelerometer study

Twenty participants, who had completed the initial questionnaire, were recruited to an accelerometer sub-study. Accelerometer data revealed that statistically, participants had not significantly underestimated their workday sedentary time but had significantly underestimated their non-workday sedentary time on the initial questionnaire.

Semi-structured interview study

Semi-structured interviews were conducted with 13 GPs who had participated in the accelerometer study. Key themes were categorised within six theoretical domains (environmental context and resources, social professional role and identity, goals, social influences, knowledge, and intentions) with sub-themes within each domain.

Feasibility study

Valid accelerometer data were obtained from 47 (77.0%) of the 57 participants. Fourteen (30.4%) participants reported burnout and sixteen (34.8%) reported severe fatigue. There were no significant associations between sitting, standing and step counts with burnout or fatigue. A power calculation was subsequently conducted to determine the number of participants required for an intervention study aiming to reduce GP burnout by improving their movement behaviours.

Conclusions

General practice is a highly sedentary occupation, with most GPs having over 10 hours of sedentary time throughout each workday. This increases their risk of developing many health problems and reduces their ability to counsel patients about healthy lifestyle behaviours. However, most GPs have lower levels of sedentary behaviour on non-workdays, which may help to offset some of the harms from their excessive sedentariness on workdays. Given that excessive sedentary behaviour is associated with increased burnout and fatigue, an intervention study aiming to improve their movement behaviours may help to reduce the high levels of burnout currently reported among GPs.

Dedication

“Short term pain can lead to long term gain,” is a quote that was used frequently during exam time in the Mayne household during my formative years. Thankfully, it was a pleasure to undertake this work, not a pain. I would not have been able to, however, without the fantastic upbringing provided by my parents; Sinclair and Alison, and my brothers; Alistair and William. I would also be nowhere without my wonderful wife; Charlotte. Since starting this research, the addition of Dasher; our rescued greyhound, and Henry; our son, have made sure that any opportunities I previously had for sedentary behaviour have been well and truly reduced! All of your support has been, and continues to be, invaluable.

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Elements of this project involved collaborative work with individuals from Queen's University Belfast, Ulster University, University of Southern Denmark, Loughborough University and University of Leicester.

Professor Mark Tully (MT) and Dr Jason Wilson (JW), from Ulster University and Dr Jan Christian Brønd (JCB), from the University of Southern Denmark, collaborated on the first accelerometer study. MT and JW loaned the accelerometers, and provided guidance on the practicalities of undertaking an accelerometer study. JCB used an algorithm to transform the raw accelerometer data into specific parameters such as step counts, sedentary time and standing time.

Dr Greg Biddle (GB) and Professor Amanda Daley (AD), from Loughborough University, Professor Charlotte Edwardson (CE), from the University of Leicester, and Professor Christopher Cardwell (CC), from Queen's University Belfast, collaborated on the second accelerometer study. GB and AD collaborated on the study design. CE loaned the accelerometers used in the study. GB posted out and received the accelerometers back from participants and processed the raw data from the accelerometers. CC provided guidance regarding the power calculation used in the study.

Presentations

Mayne R, Hart N, Heron N. Oral presentation at National GP ACF Conference, Bristol, March 2020. Session: The New Primary Care Workforce. Presentation Title: Are You Sitting Comfortably? Using accelerometers to clarify the extent of sedentary behaviour among General Practice Specialty Trainees.

Mayne R. Workshop contribution at National GP ACF Conference, Bristol, March 2020. Session: Dragon's Den. Presentation Title: Moving More. How can we reduce sedentary behaviour in the general practice setting?

Mayne R, Hart N, Heron N. Poster presentation at NIMDTA Research for Clinicians Conference, Virtual, November 2020. Sedentary behaviour among general practitioners: A systematic review.

Mayne R, Hart N, Heron N. Oral presentation at RCGP Annual Conference: A Fresh Approach to General Practice, Virtual, February 2021. Title: Remote Consulting During and Post COVID-19, Opportunities to Move More?

Mayne R, Hart N, Heron N. Oral presentation at RCGP Annual Conference: A Fresh Approach to General Practice, Virtual, February 2021. Title: Sitting comfortably? A systematic review of sedentary behaviour among general practitioners.

Mayne R, Hart N, Heron N. Oral presentation at AUDGPI/ICGP Annual Scientific Meeting, Virtual, March 2021. Title: Sedentary behaviour in general practice; Where do we stand?

Mayne R, Hart N, Heron N. Oral presentation at EGPRN Meeting, Virtual, April 2021. Title: Are we sitting too comfortably? What evidence do we have regarding sedentary behaviour among GPs?

Mayne R. Workshop at RCGP Devolved Nations Wellbeing Event: Virtual, May 2021. Title: Active consulting; Is it time to make a move?

Mayne R, Hart N, Heron N. Oral presentation at ISBNPA Conference, Virtual, June 2021. Title: Exploring sedentary behaviour among doctors working in general practice in the United Kingdom.

Mayne R, Hart N, Heron N. Oral presentation at International Conference on Sport & Society, Virtual, June 2021. Title: Are General Practitioners Sitting Too Comfortably?

Oral presentation at WONCA Europe Conference: Virtual, July 2021. Title: Sedentary behaviour among General Practitioners; Do we practice what we preach?

Oral presentation at BSLM Annual Conference: Edinburgh, September 2021. Title: Exploring sedentary behaviour and physical activity among GPs; Can we disrupt the sedentary status quo?

Mayne R, Hart N, Heron N. Workshop at RCGP Annual Conference, Liverpool, October 2021. Title: Are we sitting too comfortably? Exploring sedentary behaviour and physical activity among general practice staff.

Publications

Mayne R. Remote consulting during and post COVID-19: An opportunity to move more? *InnovAiT*. 2020;13(12):754-755. doi: 10.1177/1755738020957046.

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Mayne R, Hart N, Heron N. Exploration of sedentary behaviour among general practitioners: protocol for a mixed methods study. *Int J Clin Trials*. 2021;8(1):51-57 doi: 10.18203/2349-3259.ijct20210145.

Mayne R, Hart N, Heron N. Move your feet, lose your seat. *Ulster Med J*. 2021;90(3):192-193.

Mayne R, Hart N, Tully M, Wilson J, Brønd JC, Heron N. Exploration of sedentary behaviour among general practitioners: A cross-sectional study. *BJGP Open*. 2021;BJGPO.2021.0196 doi:10.3399/BJGPO.2021.0196.

Mayne R, Hart N, Tully M, Wilson J, Heron N. GPs' perspectives regarding their sedentary behaviour and physical activity: a qualitative interview study. *BJGP Open*. 2022;BJGPO.2022.0008 doi:10.3399/BJGPO.2022.0008

Awards

Bill Shannon prize for best presentation by a GP Trainee at AUDGPI/ICGP Annual Scientific Meeting, Virtual, March 2021.

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Abbreviations and Definitions

BMI - Body mass index.

CI - Confidence interval.

COVID-19 - Coronavirus Disease 2019.

Exercise – Physical activity that is planned, structured, repetitive and has purpose.

GP – General practitioner.

GPST - General practice specialty trainee.

HCP – Healthcare professional.

IPAQ - International Physical Activity Questionnaire.

ISAT - International Sedentary Assessment Tool.

LPA - Light physical activity.

MD - Mean difference.

MET – Metabolic equivalent of task. This is calculated as a ratio of the rate of energy expended during an activity to the rate of energy expended at rest. For example, 1 MET is the approximately the rate of energy expenditure while at rest. A 4 MET activity expends 4 times the energy used by the body at rest.

MVPA - Moderate to vigorous physical activity.

NEAT – Non-exercise activity thermogenesis.

NHS – National Health Service of the United Kingdom.

Physical activity - Any bodily movement produced by skeletal muscles that requires energy expenditure.

Physical inactivity - An insufficient physical activity level to meet current physical activity recommendations.

RCGP – Royal College of General Practitioners.

SARS-CoV-2 - Severe Acute Respiratory Syndrome Coronavirus 2.

SD - Standard deviation.

Sedentary behaviour - Any waking behavior characterised by an energy expenditure ≤ 1.5 metabolic equivalents (METs), while in a sitting, reclining or lying posture.

UK - United Kingdom.

WHO - World Health Organisation.

Preface

I have a strong personal interest in the benefits of exercise on health outcomes, having engaged in regular physical activity throughout my life. Counselling sedentary individuals to increase their levels of exercise can be a challenging experience, which requires a thoughtful and considered approach. As a doctor working in general practice, I find there to be few experiences more rewarding than seeing sedentary patients becoming more physically active. This is especially true when it leads to observable, recognisable benefits to their physical and mental health. Having previously worked in multiple hospital specialties, I found it sad and frustrating to see patients presenting with acute and chronic health problems which were the manifestations of unhealthy lifestyles. Often, lack of physical activity was a key factor. Working in primary care gives GPs a unique ability to play a key role in primary prevention of a vast range of illnesses. This provides a wonderful opportunity to intervene both *before and after* the onset of any ill health caused by unhealthy lifestyles.

I have long been aware of the health benefits of physical activity, however it is only more recently that I have learned of the detrimental effects of sedentary behaviour on health. This became of personal relevance to me during my General Practice Specialty Training, when I moved from working in a hospital emergency department, where I spent a large majority of time on my feet, to working in general practice, where I spent an even larger majority of time sitting down. I began to wonder whether this sedentary behaviour was possibly detrimental to my health, and if so, what kind of example was I setting to my patients? Going down this rabbit hole led me to undertake research to investigate sedentary behaviour and physical activity among GPs.

My aim from this research is for GPs to become more aware of the health effects of sedentary behaviour and physical activity both in their own lives, but also in the lives of their patients. By encouraging people to sit less and move more, I hope to help them live longer, happier and healthier lives.

Chapter 1 – Summary

1.1 Research progression

Although physical activity research has been well established for many years, research specifically into sedentary behaviour has only really come to prominence within the last decade. There have been well-publicised studies examining sedentary behaviour in specific population groups such as office workers (1-5), older adults (6), and children (7, 8), however there has been a lack of research examining sedentary behaviour among healthcare professionals (HCPs), including GPs. GPs have high levels of patient contact and are often the first port of call for members of the general population when they would like to discuss their health. GPs have the unique opportunity to intervene both before and after the onset of any illness which may come about from lifestyle behaviours, so can therefore play an influential role in encouraging people to improve their lifestyle choices, such as through increased physical activity. However, general practice is primarily a desk-based job, which may lead to GPs having excessive sedentary behaviour. This is could potentially be detrimental to their own health, as well as their ability to counsel patients on healthy lifestyle choices. The structure of this research project therefore followed a logical, linear progression, in order to identify the current levels of sedentary behaviour among GPs, and how this is affecting their health and wellbeing. Chapter 2 is a narrative literature review describing what is already known about sedentary behaviour and physical activity, with particular focus on GPs within the context of wider society. A lack of prior quantitative or qualitative research was identified during the narrative literature review regarding sedentary behaviour among GPs. Subsequently, a systematic review was undertaken to rigorously assess current evidence regarding sedentary behaviour among GPs. This is described in Chapter 3. In the systematic review, just two papers were identified which assessed levels of sedentary behaviour among GPs, both of which used self-reported estimations (9, 10). The logical next step in the research arc was therefore to gain up to date, objective evidence regarding sedentary behaviour among GPs, ideally using accelerometer-measured data. This was subsequently undertaken in the form of a cross-sectional study, described in Chapter 4, where questionnaire and accelerometer data were gathered to determine current levels of sedentary behaviour among GPs. Because of a lack of previous

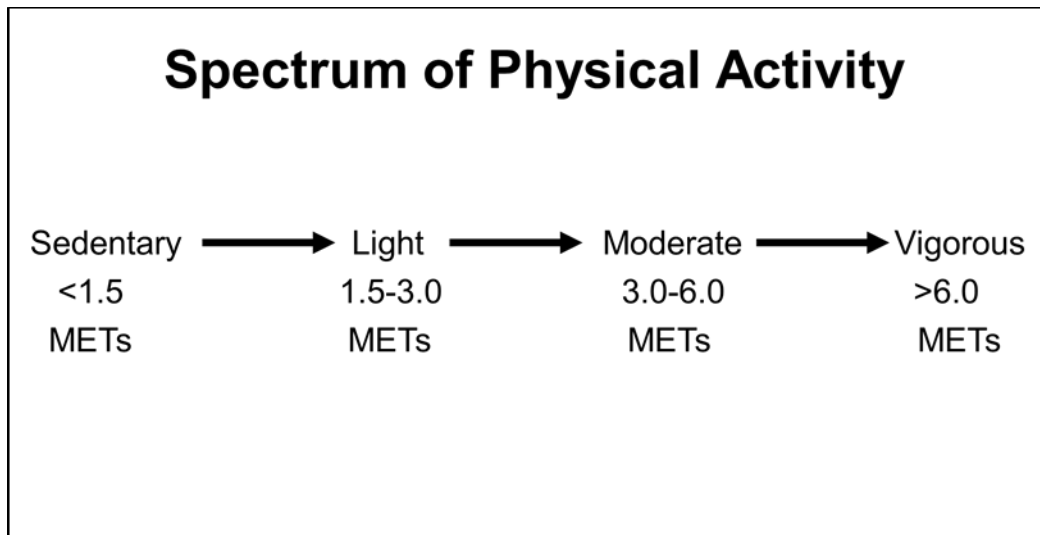
qualitative research examining perspectives of GPs regarding their sedentary behaviour and physical activity, the fifth chapter describes a semi-structured interview study of 13 GPs regarding their thoughts and perspectives on sedentary behaviour and physical activity. The qualitative study revealed that many GPs felt frustrated by their lack of physical activity and excessive levels of sedentary time on workdays. Excessive workload was identified as a key contributor to their inability to increase physical activity and reduce sedentary behaviour on workdays, with many participants reporting feelings of burnout and fatigue. Given that feelings of burnout and fatigue can be reduced by increasing physical activity, an exploratory accelerometer-measured feasibility study was subsequently conducted which examined the relationship between GP movement behaviours with burnout and fatigue. This involved gathering more accelerometer data examining movement behaviours among GPs, as well as questionnaire data regarding their subjective levels of burnout and fatigue, which is detailed in Chapter 6. The seventh and final chapter provides an overall summary of the thesis, implications for practice and future research, and personal reflections on the study.

**Chapter 2 - Sedentary behaviour among general practitioners: A
narrative literature review**

2.1 What is sedentary behaviour?

Sedentary behaviour is when someone is awake, in a sitting, lying or reclining posture, typically expending less than 1.5 METs (11, 12). METs (metabolic equivalent of tasks) allow comparisons to be made between the energy expended during different states (13). METs are calculated as a ratio of the rate of energy expended during an activity compared to the rate of energy expended at rest (13). For example, 1.0 MET is the rate of energy expenditure while sitting at rest (13). A 2.0 MET activity, such as ironing, expends twice the energy used by the body when sitting at rest (13). Physical activity can therefore be viewed as a spectrum, from light (1.5-2.9 METs, such as playing darts), to moderate (3.0-5.9 METs, such as walking), to vigorous (≥ 6.0 METs, such as cross-country skiing) (Figure 1) (14-16). Sedentary behaviour is viewed as a separate entity from physical inactivity (12). Physical inactivity is instead defined as insufficient levels of physical activity, i.e. less than current physical activity recommendations (12, 17). Current UK physical activity guidelines for adults advise at least 150 minutes of moderate intensity aerobic activity, or 75 minutes of vigorous intensity aerobic activity (or a combination both), each week (17). Muscle strengthening activities should be undertaken on at least two days per week (17). Adults should also aim to minimise the amount of time spent being sedentary, and when physically possible should break up long periods of inactivity with at least light physical activity (17). Non-exercise activity thermogenesis (NEAT), i.e. movement and posture changes during activities of daily living, overall accounts for greater energy expenditure than deliberate exercise in the vast majority of the population (18). Achieving higher levels of NEAT, alongside promoting exercise and healthy eating among the general population, is a crucial way of reducing the effects of the “obesity epidemic” affecting the modern world.

Figure 1. Spectrum of physical activity



2.2 Sedentary behaviour and health

The effect of sedentary behaviour on health has been an area of interest among researchers ever since the pioneering work of the epidemiologist, Jeremy Morris, in the 1940s and 1950s. Morris and colleagues demonstrated that sedentary bus drivers had higher rates of mortality due to coronary heart disease than bus conductors, their more active colleagues (19, 20). Since then, there has been an ever-increasing weight of evidence to demonstrate the negative health effects of sedentary behaviour (21). It is now acknowledged that sedentary behaviour is associated with multiple adverse health outcomes, including mental health issues, obesity, type 2 diabetes, multiple forms of cardiovascular disease and dementia, as well as breast, colorectal, endometrial and ovarian cancer (21-25). As a result of these adverse health outcomes, sedentary behaviour is associated with increased all-cause mortality, even when allowing for confounding variables (25-28). These findings demonstrate a dose-response relationship, whereby increasing sedentary time corresponds with increasing mortality rate (25-28). Sedentary behaviour and physical inactivity have significant economic costs. Conservatively estimated, physical inactivity was calculated to cost the UK National Health Service (NHS) £1.4 billion, with worldwide costs estimated at £41.9 billion in 2013 (29, 30). More specifically,

sedentary behaviour was estimated to cost the UK National Health Service (NHS) £0.7 billion in 2016-2017 (31). A total of 69,276 deaths could potentially have been avoided in the UK if sedentary behaviour was eliminated (31). In light of these findings, 2019 UK physical activity guidelines state that through all stages of life, individuals should minimise their sedentary behaviour, and break up periods of sedentary behaviour where possible (17).

2.3 Parallels with smoking

At the same time that Morris and his colleagues were first establishing the detrimental effects of sedentary behaviour on health, two other prominent epidemiologists, Richard Doll and Austin Bradford Hill, began to explore the health effects of smoking tobacco (32, 33). This led to the famous cohort studies examining the mortality of doctors in relation to their smoking habits (34-40). These demonstrated associations between smoking and cancers of the mouth, oesophagus, pharynx, larynx, lung, pancreas, and bladder, as well as cardiovascular and respiratory diseases, which contributed to a significantly increased mortality rate among smokers compared to non-smokers and ex-smokers (34-40). Smoking shows a dose-response relationship with mortality rate, whereby increasing amounts of smoking correspond with increasing mortality rates (36-40). Following the dissemination of these findings, rates of smoking among doctors around the world reduced significantly during the second half of the 20th century and continued to decline into the 21st century (40-46). This demonstrates a substantial culture-shift from the days when doctors were seen to promote cigarettes in advertising campaigns (47, 48). Rates of smoking among doctors have now fallen to among the lowest of any occupation (49-51). Similarities in the detrimental health effects of both sedentary behaviour and smoking have led some to view sedentary behaviour as “the new smoking” (52). It is interesting to note how doctors have led the way with reducing their levels of smoking (40-46, 49-51). Have doctors also led the way with reducing their levels of sedentary behaviour?

2.4 Sedentary behaviour and physical inactivity among general practitioners: clarifying the extent of the problem

It is only in recent years that sedentary behaviour has been identified and defined as a separate entity from physical inactivity (12). For this reason, there have been few previous studies examining sedentary behaviour among GPs. In one self-reported questionnaire survey comprising 219 valid responses from GPs and GP trainees in Ireland, 60% of participants reported more than 7 hours of daily sitting time (9). In a self-reported questionnaire survey of female family doctors in Estonia, 56% of the 198 participants reported sitting for over 6 hours each day (10). A limitation of these studies is that both used self-reporting, which is less reliable than objective data, such as that obtained by accelerometers (53, 54).

There have been numerous studies examining levels of physical activity among GPs. Although there is considerable variation in the personal health practices of GPs between different countries and regions throughout the world, the majority of GPs do not meet current physical activity guidelines (9, 51, 55-58). A limitation of studies investigating physical activity is a lack of standardised terminology regarding physical activity, as well as a lack of objective data. Physical activity levels among GPs generally correlated with findings among doctors of other specialties (57, 59-65).

Some studies of physical activity and sedentary behaviour among doctors have differentiated between different medical specialties, work environments and levels of training. When focusing specifically on GP trainees, those who were working in a hospital setting (in different medical specialties to general practice), had greater levels of physical activity and less sedentary behaviour than trainees in general practice posts (9, 66, 67). Levels of physical activity have also been shown to change during different stages of medical training, with a reduction in physical activity as individuals move from studying at medical school to working as a doctor (57, 64).

Interestingly, although many GPs do not meet current physical activity guidelines, some studies suggest that GPs have higher levels of physical activity than the general population (51, 58, 61). At present, over one third of the UK adult population do not meet the UK aerobic physical

activity guidelines (68-71). More specifically, at least one fifth of UK adults undertake less than 30 minutes of moderate activity per week (68, 69, 71). Working UK adults also average more than four hours of sedentary behaviour at work, and over four hours of sedentary behaviour outside of their work each day (68-70). There are some limitations of surveys of physical activity and sedentary behaviour in the UK. At present, these are not standardised and are undertaken independently in the four home nations (72). They also rely on self-reporting, which is less reliable than objective data, (53, 54, 72, 73).

2.5 General practitioners as influencers of patient health behaviours

Primary care has been described as “the cornerstone” of the NHS, providing over 300 million patient consultations per year (74, 75). This enables GPs to play an important role in both primary and secondary prevention, by providing evidence-based lifestyle guidance to patients. GPs can reinforce important public health messages among their patients, making them more specific, individualised and personally relevant. Despite the opportunities among doctors to promote healthy lifestyles, knowledge of physical activity guidelines among UK medical students is poor (76). Only half of UK medical students feel adequately trained to give physical activity advice to the general public (76). Physical activity promotion and guidance from GPs to their patients has generally been shown to be poor (77, 78). Numerous studies have demonstrated that GPs who are more physically active are more likely to recommend physical activity to their patients (56, 59, 65, 79-85). Patients are also more likely to make healthy lifestyle changes recommended by their doctor if they believe their doctor follows the health advice themselves (86-89). It could therefore be argued that reducing sedentary behaviour and increasing physical activity among GPs could lead to health benefits for both GPs themselves, at an individual level, and their patients, at a population level. This could play a vital role, as part of a multifaceted approach alongside public health initiatives and changes to the built environment, in ensuring a culture shift away from an increasingly sedentary society, towards an increasingly physically active society.

2.6 Are there any ways of reducing sedentary behaviour among general practitioners?

Despite the lack of objective data, it is obvious that working in general practice is often a highly sedentary occupation. The average working day of a GP involves prolonged sedentary time, both when consulting with patients and when performing paper, telephone and computer-based work. Some adaptations have led to increased levels of sedentary behaviour over time.

2.6.1 The intercom or call screen

Using an intercom or electronic call screen to summon patients from the waiting room to the consulting room can be problematic on a range of different levels. It can cause difficulties for patients with hearing, visual or other impairments, who may be unaware that they have been called to the consulting room. It may be detrimental to the patient-doctor interaction, as being greeted in person is a more patient-centred approach than being summoned by an electronic screen or an intercom. Despite the emphasis on consultation skills among GPs, there has been little by way of research to examine the effect of different methods of greeting patients on the patient experience (90). Some GPs believe that “consultations start in the waiting room,” as this allows a more thorough assessment of the patient’s gait and general demeanour. It also allows an opportunity for health promotion, by explaining the benefits of increasing physical activity and reducing sedentary behaviour. Using an intercom or call-screen, instead of walking to the waiting room, is also detrimental to the health of doctors. Walking to the waiting room provides an opportunity to break up sedentary time between every consultation, which is in line with current UK Physical Activity Guidelines to “minimise the amount of time spent sedentary (sitting) for long periods” (17). By doing some simple calculations, a doctor can estimate how many more steps and distance they would complete each day, within their working environment, by walking to the waiting room to call patients instead of remaining seated in their chair. They simply need to determine the distance from their chair to the waiting room and back and/or how many steps it takes to cover this distance, and multiply this by the number of patients they see per day, week, year, or even throughout their whole career. As an example, although walking 20-40 steps per patient may not seem like a huge number, if this is

multiplied by 30 patients per day, on 4 days per week, over 48 weeks a year, this would amount to somewhere between 115,200 and 230,400 additional steps per year.

2.6.2 Height-adjustable standing desks

Standing is not a sedentary behaviour, and is estimated to expend at least 1.5 METs, and 12% more energy than sitting (16, 91). Standing desks have been used for many years, with Leonardo da Vinci and Winston Churchill, among others, reported to have been exponents. Height-adjustable standing desks allow the user to sit or stand behind the desk, depending on the circumstances. It is debatable whether or not standing would be appropriate during most consultations, as it contrasts with the traditional primary care consultation model, in which both the patient and the doctor are seated. An example of the diverse views on this topic was demonstrated in the responses to an opinion piece in the BMJ in 2014, titled “Consultations in primary care should be held standing up” (92). It is likely that if the doctor is standing while the patient is seated, or both patient and doctor are standing, the dynamic of the consultation will be different than if both are seated. However, there has been little previous research examining the perspectives of either patients or doctors towards sitting or standing during consultations, particularly in the general practice setting. Current evidence appears to be limited to the experiences of patients in the hospital setting, and generally seems to indicate that patients prefer consultations with both patient and doctor in a seated position (93-96). If the doctor is seated, the doctor is often perceived to be more empathetic, and take more time with the patient, even if they had spent exactly the same amount of time with the patient while standing (93-96). It has been suggested that the position of the patient and the doctor could vary depending on the nature of the consultation (92). Shorter, less complex consultations could be held with the doctor and/or patient in a standing position, while longer and more complex consultations could be held with both patient and doctor in a seated position (92). One argument against the doctor standing, if the patient is seated, is a power imbalance which could negatively affect the dynamic of the consultation. It is worth considering, however, that in the current consulting model, the doctor is often in a much more sophisticated and

comfortable chair than the chair offered to the patient, so it could be argued that there is already a considerable power imbalance between patient and doctor.

2.6.3 Active transport

Another example of where sedentary behaviour of GPs could be reduced is during transport to and from work, and when performing home visits. Active transport (such as walking, running or cycling) instead of travelling in a motorised vehicle, directly replaces sedentary behaviour with physical activity, and provides a good example to patients and wider society. There are some obvious barriers to active transport. One issue is concerns around infrastructure, such as the existence of safe roads and pavements, as well as the availability of shower facilities. Another issue is time efficiency, as travelling by car may be faster, particularly in rural and isolated areas. In some cases, however, active transport may be quicker than travelling by car, particularly in congested urban areas, where there may also be difficulties in finding a parking spot for a car. The use of active, instead of motorised transport, requires buy-in at both an individual and societal level, with the development and use of safe infrastructure, which is constructed with consideration of multiple different transport methods, not just motorised vehicles. In England and Wales, increasing walking and cycling in urban areas and less use of cars would lead to savings of roughly £17 billion per year to the NHS (97). Despite this, active transport receives only a small proportion of the overall transport budget (98). It could be argued that increasing expenditure on active transport would lead to considerable overall cost savings, by creating a healthier population.

2.7 Health behaviour change

Encouraging people to change their health behaviours for the better is a complex task, with many considerations. This is reflected in the multitude of frameworks regarding the implementation of positive health behaviour changes. One of the most widely used is the behaviour change wheel, which was developed by Michie and colleagues in 2011 (99). The behaviour change wheel uses the COM-B system, which explains how an individual's health behaviours are influenced by their capability, their opportunity, and their motivation to change

(99). It is therefore vital to consider these aspects when planning a health behaviour change intervention. When examining positive health behaviour change in the context of reducing sedentary behaviour among GPs, the COM-B system can be helpful in identifying specific considerations. Firstly, GPs must feel capable of reducing their sedentary behaviour. Secondly, GPs need to feel like they have an opportunity to improve their movement behaviours. Thirdly, there is a requirement for GPs to have the motivation to do something to reduce their sedentary behaviour and increase their physical activity. Different people will be influenced by different factors, and what works for one individual may not work for another. When considering GP sedentary behaviour, an individual may be influenced by factors such as their workload, their personal health characteristics, and their social influences, to name just a few. It is easy to see how a GP would be much more likely to purchase (and use) a sit-stand desk if they had the financial capability to afford one, the autonomy to set one up in their consulting room, the awareness of the harms of sedentary behaviour, and the positive social influence of colleagues already using sit-stand desks. It would be much less likely for an individual GP to use a sit-stand desk if any one of these components was missing.

2.8 Environmental benefits of reducing sedentary behaviour

Reducing sedentary behaviour and increasing physical activity has obvious environmental benefits. Active transport avoids many of the negatives of motorised transport, such as hazardous emissions and noise pollution. Inhalation of air pollutants from motorised vehicles can cause or exacerbate multiple health issues, such as cardiovascular and respiratory diseases, as well as causing environmental damage (100). Increased physical activity, through active transport, provides the benefits of better health outcomes for the individual, as well as improving the connectedness between the individual and their environment. Reducing the use of motorised transport results in reduced carbon emissions, not just in direct emissions by the vehicles themselves, but also in their manufacture. Increasing physical activity, such as by taking the stairs, can also reduce carbon emissions if the electricity for elevators or escalators comes from fossil-fuelled power stations.

2.9 Monitoring technology and sedentary behaviour

Although there are lots of wearable devices available to people for monitoring their physical activity and step counts, such as mobile phone applications, smart watches and pedometers, there is a lack of effective, commercially available devices capable of monitoring sedentary behaviour. Thigh worn devices, such as accelerometers, which are the gold-standard in sedentary behaviour research, are not widely used by the public. It is likely that this is because wearing a device affixed to the thigh is quite burdensome for individuals to use. The problem with wearable devices worn on the wrist or hip is that they cannot detect when the wearer is sitting or standing, such as at a sit-stand desk, as people move their arms in the same way in either position.

2.10 Conclusion

Many of the innovations and adaptations in the modern world, both inside and outside the field of healthcare, have led to population-level health benefits. Significant improvements in the prevention and treatment of numerous illnesses have been made possible thanks to human ingenuity, resulting in increasing global life expectancy and population growth over time. Although many advancements have undoubtedly been beneficial to human health, some have had detrimental effects on human health and the health of our planet. Many of the advancements made during the agricultural, industrial and digital revolutions have made life more sedentary and less physically active than ever before. Where people previously had to be physically active to travel and to obtain food, people can now travel vast distances and obtain significant quantities of food with minimal physical exertion. Many jobs requiring high levels of physical activity, particularly in the developed world, have now disappeared and been replaced by machines. Many more people are now employed in jobs requiring minimal physical activity than in the past. In many circumstances, the modern world has developed in a way that has minimised NEAT to the detriment of human health. Alongside the increased consumption of calories, this is one of the main reasons behind the steady increase in global average body mass index (BMI) levels over time (101, 102). In 2016 the average global BMI was 25 for females, and

24.5 for males, up from 22 and 21.7, respectively, in the 1970s (101, 102). With global levels of smoking, and death rates from smoking decreasing over time, the negative health effects of overweight (BMI >25) and obesity (BMI >30) will continue to become increasingly relevant and significant during the course of this century (103).

To reduce the burden of overweight and obesity requires cultural change away from a society which is becoming increasingly sedentary, towards one which is increasingly physically active. Could it be possible to retain the health benefits of living in the modern world, while simultaneously reducing some of the harmful health-effects of modern living? To do so requires buy-in and engagement at all levels of society. Healthcare workers should be at the forefront of this culture-change, to improve both their own health and the health of their patients. GPs, in particular, can be key protagonists by virtue of their position in the healthcare system, where they have significant levels of patient contact and opportunities for health promotion.

At present, there appears to be a paucity of research examining current levels of sedentary behaviour among GPs. The aims of this thesis are therefore:

- To systematically examine and synthesise previous research regarding levels of sedentary behaviour among GPs;
- To obtain quantitative data regarding current levels of sedentary behaviour among GPs;
- To gain qualitative data regarding the barriers and facilitators to GPs improving their movement behaviours;
- To explore the feasibility of undertaking an intervention study aiming to reduce sedentary behaviour and increase physical activity among GPs.

**Chapter 3 - Sedentary Behaviour Among General Practitioners: A
Systematic Review**

3.1 Aims

This systematic review was conducted due to the lack of previous research regarding sedentary behaviour of GPs which was identified in the narrative literature review. It aimed to comprehensively examine and synthesise how sedentary behaviour had previously been measured in the primary care literature to identify current available evidence regarding sedentary behaviour of GPs. A systematic review was chosen over a scoping review, as a scoping review would likely have revealed similar findings to the narrative literature review which had already been conducted.

3.2 Background

Previous studies have examined levels of sedentary behaviour among various professions (104, 105), however general practice is a different working environment, with different challenges and opportunities from other professions, even within the field of healthcare. Primary care has been described as “the cornerstone” of the NHS, providing over 300 million patient consultations per year (74, 75). This enables GPs to play an important role in both primary and secondary prevention, by providing evidence-based lifestyle guidance to patients. GPs can reinforce important public health messages among their patients, making them more specific, individualised and personally relevant. Numerous studies have demonstrated that GPs who are more physically active are more likely to recommend physical activity to their patients (56, 59, 65, 79-85). Patients are also more likely to make healthy lifestyle changes recommended by their doctor if they believe their doctor follows the health advice themselves (86-89). It could therefore be argued that reducing sedentary behaviour and increasing physical activity among GPs could lead to health benefits for both GPs themselves, at an individual level, and their patients, at a population level. Within the context of day-to-day general practice, this would primarily involve interrupting or replacing prolonged periods of sitting with physical activity. One example is the use of active workstations, such as standing desks, combined with short breaks for physical activity, such as “exercise snacks”. Sitting while using a computer or telephone is a form of sedentary behaviour (≤ 1.5 METs), whereas standing while using a

computer or telephone is a form of light physical activity (1.8 METs) (16). Reducing sedentary behaviour among GPs, by replacing sedentary behaviour with physical activity, could therefore play a vital role, as part of a multifaceted approach alongside public health initiatives and changes to the built environment, in ensuring a culture shift away from an increasingly sedentary society, towards an increasingly physically active society.

The aim of this systematic review was to identify the current levels of sedentary behaviour among GPs by examining and synthesising how sedentary behaviour has been measured in the primary care literature.

3.3 Methods

This systematic review was conducted according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidance. The focus of this review was the identification of peer-reviewed, published articles which reported sedentary behaviour among GPs (including family doctors and primary care doctors and/or physicians). Searches were performed using Medline®, Embase®, PsycINFO and Web of Science databases, with assistance from a medical librarian (last search performed on 29th January 2020), with a subsequent search of grey literature within the Cochrane Library and hand-searching of reference lists. Terms relating to general practice and sedentary behaviour were combined using keywords, title, or abstract, with appropriate alternative spellings and truncation symbols. Due to the small number of available studies identified, a narrative synthesis was undertaken of the included studies.

3.3.1 Study Selection

Detailed searches were performed within Medline®, Embase®, PsycINFO and Web of Science databases, as well as searching for grey literature within the Cochrane Library and through the hand-searching of reference lists of screened studies. A supervisor and I (NHe and RM) independently screened titles and abstracts of publications retrieved from the completed searches, once duplicates were removed. A third supervisor (NHa) was available to resolve any conflicts in study inclusion. Articles were discarded if they did not meet the inclusion criteria,

with a record kept of the number discarded at each stage and reason for exclusion. Although no language restrictions were made, all included papers were written in English. Extracted data included populations and settings, sample sizes and response rates, methodological issues, eligibility criteria, study design, and definitions and measures. The terms 'general practitioner', 'GP', 'family physician', and 'family practitioner' were all considered to relate to the same discipline. For the purposes of this study, the term used is 'general practitioner' or 'GP'.

3.3.1 Data Synthesis and Quality Assessment

Data were synthesised in terms of reported hours of sedentary behaviour among study participants. Objective criteria were used to assess quality and risk of bias within recruitment, sample population, reliability and validity of outcome measures according to the Newcastle-Ottawa quality assessment scale adapted for cross sectional studies, as previously described by Herzog et al.(106) and Luchini et al. (107) (appendix 1).

3.4 Results

1707 studies were identified after duplicates were removed. After screening titles and abstracts, 1673 were excluded. Out of 34 full text articles which were reviewed, only 2 measured sedentary behaviour among GPs, both of which were included in the final review (Figure 2). Applying the Newcastle-Ottawa quality assessment scale adapted for cross sectional studies, both included studies were of satisfactory methodological quality (Table 1). The main reasons for study exclusion were studies not taking place in the general practice setting, studies examining patients, not GPs themselves, and studies not examining sedentary behaviour. Although 5 studies initially appeared to relate to levels of sedentary behaviour among GPs, 3 of these were excluded as they used an incorrect, imprecise or outdated definition of sedentary behaviour (56, 59, 108). Brotons et al. (56), Cornuz et al. (59) and Jonsdottir et al. (108) did not clearly state how they defined GPs as being sedentary. It appears that they were instead referring to GPs who did not exercise regularly, who would currently be defined as being physically inactive (ie. not meeting physical activity recommendations).

The first study included was a cross-sectional survey of all GP trainees and GP trainers in the Republic of Ireland by Keohane et al. (9). In total there were 219 eligible respondents (9). The primary aim of the study was to explore levels of physical activity among Irish GPs and GP trainees, with an additional aim of investigating their perceived barriers to exercise (9). The study used the self-administered International Physical Activity Questionnaire (IPAQ) to assess levels of physical activity (9, 109, 110). Within the short form of the IPAQ, although it is primarily a tool used for self-estimation of physical activity, there is a question relating to sedentary behaviour (109). Participants are asked about the time they spend sitting on a weekday while at work, at home, while doing course work and during leisure time, which may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television (109). In the study by Keohane et al., 60% reported spending in excess of 7 hours sitting each day, 24% between 4 and 7 hours, and 16% less than or equal to 4 hours (9). There was no significant difference in sitting time between male and female respondents ($p=0.61$) (9). There was, however, a statistically significant difference in sitting time reported by trainees working in hospital compared to those working in GP Practices ($p<0.05$) and between qualified GPs and GP trainees ($p<0.05$) (9). There was no specific detail of the mean levels of sitting time within each of these groups (9). It is likely that trainees working in the hospital setting were overall less sedentary than those working in the GP Practice setting, and therefore GP trainees were overall less sedentary than qualified GPs, however, in the absence of sufficient data we cannot say this with certainty (9).

The second study included was a cross-sectional survey of female GPs in Estonia (10). There were 198 responses included in the analysis (10). The aim of this study was to explore physical activity among Estonian GPs, as well as their physical activity counselling practices (10). Only female GPs were included, as 95% of GPs in Estonia were female at the time of the study (10). The self-administered International Physical Activity Questionnaire (IPAQ) short form was translated into Estonian and used to assess self-reported levels of physical activity, as well as sitting time (10, 109, 110). The mean amount of daily sitting time was 6 hours and 36 minutes, with 56% sitting for over 6 hours per day (10). Levels of physical activity were compared between those who reported sitting less than 6 hours per day and those who reported sitting

more than 6 hours per day (10). Although those who reported sitting less than 6 hours per day appeared to be slightly more physically active, this was not statistically significant ($p=0.207$) (10). The results of both included studies are summarised in Table 2.

Figure 2 – Flow diagram for identification, screening, eligibility, and inclusion of papers for review

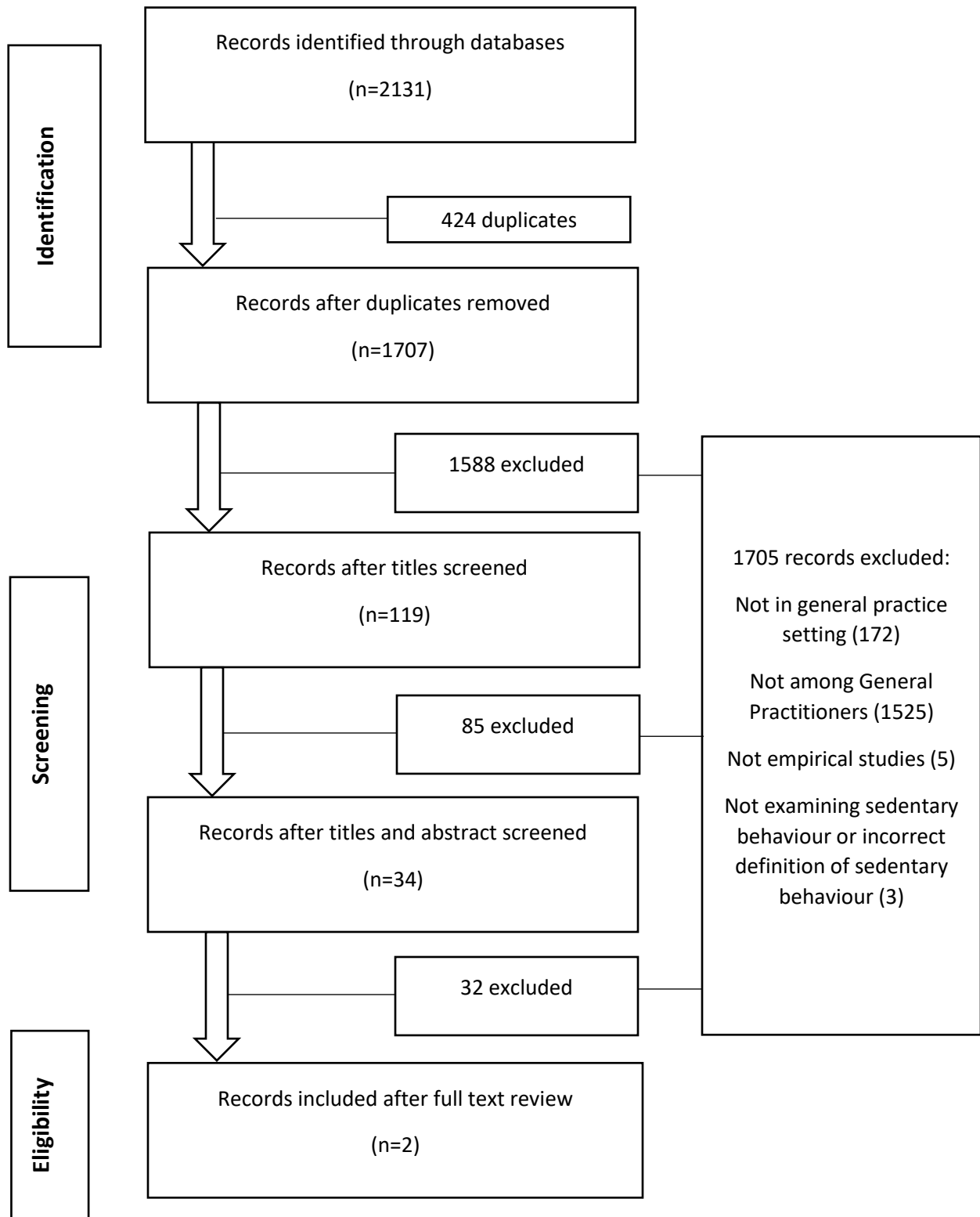


Table 1. Quality assessment of the included studies based on the Newcastle-Ottawa quality assessment scale adapted for cross sectional studies

Study	Design	Selection (max. 5*)				Comparability (max. 2*)	Outcome (max. 3*)		Total score (max. 10*)
		Representativeness of the sample	Sample size	Nonrespondents	Ascertainment of exposure		Based on design and analysis	Assessment of outcome	
Keohane et al. (43)	Cross-sectional	*	*		**	*	*		6*
Suija et al. (46)	Cross-sectional	*	*		**	*	*		6*
Scoring: <ul style="list-style-type: none"> • Very Good Studies: 9-10 stars • Good Studies: 7-8 stars • Satisfactory Studies: 5-6 stars • Unsatisfactory Studies: 0 to 4 stars 									

Table 2. Description of included studies

Author	Country	Number of participants	Study design	Criteria for inclusion	Assessment method	Objectivity	Quality
Keohane et al.	Ireland	219	Cross-sectional	GP Trainers and GP Trainees	Self-reported questionnaire	Non-objective	Satisfactory
Suija et al.	Estonia	198	Cross-sectional	Female GPs	Self-reported questionnaire	Non-objective	Satisfactory

3.5 Discussion

3.5.1 Overview

This was the first systematic review of the levels of sedentary behaviour among GPs. 1707 studies were identified from our search criteria, with 2 studies included in the final review. Included studies were cross-sectional, with self-reporting of sedentary behaviour in hours and minutes. Both studies were of satisfactory methodological quality, however both had risk of bias and lack of objectivity. They both focused primarily on levels of physical activity among GPs, using the International Physical Activity Questionnaire (IPAQ). In the IPAQ, just one question concerns sedentary behaviour, where participants are asked to estimate how much time they spent sitting on a week day (109). Both studies may have been affected by selection bias, whereby survey participants may have been less sedentary and more physically active than those who did not respond. The study by Suija et al. questioned only female GPs, so findings may not be valid among male GPs, however there were no significant differences between males and females in the study by Keohane et al. (10). As responses were self-estimated, as opposed to objectively measured findings, participants may also have either overestimated or underestimated their true levels of physical activity and sedentary behaviour.

Both studies used validated questionnaires for the self-assessment of physical activity and sedentary behaviour. There is some debate regarding the validity of self-estimated, compared to objectively measured, findings of sedentary behaviour and physical activity (73, 109-116). It is widely acknowledged that objective data (such as that obtained using accelerometers or pedometers) has higher validity than self-estimation of sedentary behaviour and physical activity, with self-estimation shown to typically underestimate sedentary behaviour by approximately 1.74 hours per day (112, 113, 117). With the recent increase in remote consulting among GPs as a result of the COVID-19 pandemic, GPs have less face-to-face interaction with patients, with the majority of consultations now happening via telephone and video (118). This opens up both challenges and opportunities for GPs regarding their levels of sedentary behaviour (119, 120). It does, however, mean that GPs now have more in common with workers in other medical and non-medical environments, such as office and call centre workers, where interventions targeted at reducing levels of sedentary behaviour have had varying levels of success (1, 121-124).

3.5.2 Strengths and Limitations

Strengths of this systematic review were the use of a clearly defined search and study selection strategy, with double reviewing of all stages. Using a wide search strategy, with no exclusion based on language, supplemented by hand-searching of reference lists, allowed authors to identify as many eligible studies as possible. Despite this, just 2 eligible studies were identified, both in English. A limitation of this review is the lack of studies available in the area of sedentary behaviour among GPs. Sedentary behaviour is a novel and emerging area of research. Although there has been an increasing volume of research examining sedentary behaviour in other settings, this study has identified a lack of research in the field of general practice. Most studies in the general practice setting appear to focus on either physical activity or sedentary behaviour of patients, not among GPs themselves.

3.6 Conclusion

In light of the established associations between sedentary behaviour, adverse health outcomes and mortality, GPs should consider their own levels of sedentary behaviour, as well as that of their patients. GPs can potentially be key protagonists in reducing sedentary behaviour among the general population by virtue of their position in the healthcare system, where they have significant levels of patient contact and opportunities for health promotion.

At present, there is a paucity of research examining current levels of sedentary behaviour among GPs. This systematic review identified just 2 papers assessing levels of sedentary behaviour among GPs, both of which used self-reported estimations (9, 10). Given that GPs who are more physically active are more likely to recommend physical activity to their patients, and patients are more likely to make healthy lifestyle changes if they believe their doctor follows the health advice themselves, by reducing their sedentary behaviour and increasing their physical activity, GPs could play an important role in the development of a less sedentary and more physically active society (86-89). There is therefore a clear need for more reliable and objective data to determine the current levels of sedentary behaviour among GPs, particularly in light of the increase in remote consulting as a result of the COVID-19 pandemic.

Chapter 4 - Exploration of sedentary behaviour among general practitioners: A cross-sectional study

4.1 Aims

The primary aim of this study was to gain quantitative data on current levels of sedentary behaviour among GPs and General Practice Specialty Trainees (GPSTs).

The specific objectives of this study were:

- To quantify current levels of sedentary behaviour among GPs and GPSTs on a typical workday;
- To quantify current levels of sedentary behaviour among GPs and GPSTs on a typical non-workday;
- To identify differences in the levels of sedentary behaviour between GPs and GPSTs depending on their working environment, age and gender;
- To establish the proportion of GPs and GPSTs with access to “active workstations” such as standing desks;
- To ascertain if levels of sedentary behaviour of GPs and GPSTs have been affected by changes due to the COVID-19 pandemic.

4.2 Methods

4.2.1 Design

A mixed-methods cross-sectional study following a sequential design, incorporating an initial online questionnaire survey and subsequent accelerometer study. A protocol was previously published (125) and registered on the ClinicalTrials.gov website. The study was conducted in accordance with the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) guidance statement (126).

Stage 1: Online questionnaire study:

Questionnaire design and distribution:

An initial online questionnaire (Appendix 2) was distributed to GPs and GPSTs throughout Northern Ireland using email (out of hours, educational and GP trainer/trainee mailing lists) and social media (Facebook and Twitter). GPs and GPSTs in Northern Ireland have similar working conditions to their contemporaries throughout the rest of the UK, providing care for patients as part of the NHS. Many different questionnaires have been used to determine levels of sedentary behaviour among large population groups. Multi-item questionnaires, with a relatively short recall period, have been shown to be more reliable for assessing sedentary behaviour than single item questions and longer recall periods (117). The questionnaire used in this study was based on the International Sedentary Assessment Tool (ISAT) (115). The ISAT comprises questions related to specific aspects of sedentary behaviour identified as being the most reliable and valid from a systematic review of 49 sedentary behaviour questionnaires (127). Our questionnaire obtained additional information regarding the age, gender and working practices of each participant, plus specific questions regarding overall sedentary time on a working day and on a day off work. Further questions explored access to active workstations (such as standing desks), whether sedentary behaviour had changed as a result of the COVID-19 pandemic, and whether participants would prefer more, the same, or less time sitting when in work, with options for free-text responses where appropriate. Participants were recruited voluntarily, with no obligations or rewards for taking part. Before the survey was disseminated, it was piloted for face validity among academic GP researchers. The Faculty of Medicine, Health and Life Sciences Research Ethics Committee of Queen's University Belfast approved the study and all participants provided informed consent. The online survey was live on Microsoft Forms 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. Comparisons between GPs and GPSTs with different survey responses were analysed using independent t-tests and chi-square tests where appropriate. All tests were 2-sided with statistical significance set at $p < 0.05$. Qualitative data was summarised according to relevant descriptive themes.

Stage 2: Accelerometer study:

Recruitment and data collection:

A purposive, maximally varied sample of 20 questionnaire respondents were recruited to the subsequent accelerometer study. Participants were chosen based on their responses to the online questionnaire. Purposive sampling was undertaken to ensure a maximally varied sample, by selecting individuals with a range of demographic characteristics (such as age and sex) and self-reported levels of sedentary behaviour (high, medium and low levels of self-reported sedentary time). Purposive sampling was undertaken as there were concerns that if random sampling was used, there would be a higher likelihood that individuals with lower levels of sedentary time and higher levels of physical activity would take part, as these individuals would be more likely to be interested in their wearable health data. Participants were recruited voluntarily, with no obligations or rewards for taking part. They were advised that a thigh-worn accelerometer, worn affixed to their thigh continuously for one week, was the gold-standard in sedentary behaviour research, and would therefore provide more detailed data than self-reported data. They were also informed that their data would be pseudonymised and stored securely as per data protection regulations. The Faculty of Medicine, Health and Life Sciences Research Ethics Committee of Queen's University Belfast approved the study and all participants provided informed consent. Each participant was posted an Axivity AX3 accelerometer, along with adhesive waterproof dressings (Tegaderm roll, 3M, Saint-Paul, Minnesota, USA) and instructions on how to wear the accelerometer. Thigh-worn accelerometers have been shown to be highly accurate for distinguishing between sedentary behaviour (such as sitting or lying down) and other behaviours (such as standing and physical

activity) (128). Axivity AX3 accelerometers have been validated for the estimation of sedentary time and show good equivalence with other brands of accelerometers (129). Consenting participants were asked to wear the accelerometer continuously over a seven-day period, using a waterproof, adhesive dressing on the middle of the right thigh. They were also asked to complete a contemporaneous sleep/work log for the duration of the study (Appendix 3). At the end of the seven days, participants were instructed to return the accelerometer and sleep/work log to the research team using a stamped, addressed envelope.

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 study. Exclusion criteria were: not having completed the online sedentary behaviour questionnaire; not having consented to wearing the accelerometer during the study period; having a medical comorbidity that the participant felt would impact on their sedentary time; being on annual leave during the duration of the study period; undertaking contact sports that could damage the accelerometer.

Analysis:

Accelerometers were programmed to capture triaxial acceleration data during the duration of the study at 50Hz with a dynamic range of +/- 8g. Specific details on accelerometer data processing and analysis can be found in a previous study which also used Axivity AX3 accelerometers (130). 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 as required for previous accelerometer studies (131). A valid workday required the participant to be working at least one session in a general practice setting. Accelerometer data was used to determine sedentary time, step count and time spent during light (LPA) and moderate-to-vigorous (MVPA) physical activity. Alongside the sleep-work logs, this allowed comparison of sedentary time and physical activity to be made between workdays and non-workdays.

4.3 Results

4.3.1 Online questionnaire

Sample demographics:

There were 1999 GPs and GPSTs working in Northern Ireland at the time of the study. This comprised 1633 GPs on the Northern Ireland Performers List, plus 366 GPSTs listed with the Northern Ireland Medical and Dental Training Agency. It is unlikely that every individual within the total population of 1999 GPs and GPSTs in Northern Ireland were informed of the survey, as not all will have been included in the mailing lists used, or active on social media at the time of the survey link being posted. A total of 353 people accessed the online survey, comprising 17.7% of the overall population. One participant did not answer any questions and three participants did not answer any questions apart from number of sessions worked. They were excluded from the analysis. Five participants did not self-estimate their sedentary time, so only their free-text responses were analysed.

The average age of all participants was 39.9 years (Standard Deviation (SD) 10.3), with most participants being female (61.7%). GPs comprised 74.2% of participants, with the remainder being GPSTs. GPs and GPSTs working in general practice at the time of the study comprised 92.0% of participants, with an average age of 40.7 years (SD 10.2). 8.0% of participants were not working in the general practice setting at the time of the study. These participants were all GPSTs, with an average age of 32.5 years (SD 7.7), working in secondary care settings such as Emergency Medicine, Paediatrics and Psychiatry. 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 less than full time.

Sedentary time:

On average, participants reported higher average overall sedentary time on workdays (10.33 hours (SD 2.97)) than non-workdays (4.78 hours (3.02)) (Mean Difference (MD) 5.55 hours, 95%

Confidence Interval (CI) 5.08 to 6.02, $p < 0.001$). There was no significant difference in mean overall workday sedentary time between females (10.45 hours (SD 3.12)) and males (10.05 hours (SD 2.75)) (MD 0.40 hours, 95% CI -0.39 to 1.08, $p = 0.301$), or in non-workday sedentary time between females (4.92 hours (SD 3.25)) and males (5.02 hours (SD 2.97)) (MD 0.10 hours, 95% CI -0.83 to 0.61, $p = 0.918$).

Participants working in general practice reported higher mean overall workday sedentary time (10.33 hours (SD 2.97)) than those working in secondary care settings (7.9 hours (SD 3.43)) (MD 2.43 hours, 95% CI 1.2 to 3.37, $p < 0.001$). However, those working in general practice reported lower mean overall sedentary time on non-workdays (4.78 hours (SD 3.02)), than those working in secondary care settings (6.17 hours (SD 3.67)) (MD 1.38 hours, 95% CI 0.17 to 2.60, $p = 0.025$).

Among participants working in the general practice setting, there was no significant difference in mean overall workday sedentary time between GPs (10.25 hours (SD 2.98)) and GPSTs (10.72 hours (SD 2.87)) (MD 0.47 hours, 95% CI -1.40 to 0.45, $p = 0.318$). However, among this subgroup GPSTs reported higher overall sedentary time (5.9 hours (SD 3.36)) than GPs (4.5 hours (SD 2.87)) on non-workdays (MD 1.4 hours, 95% CI 0.55 to 2.26, $p = 0.001$).

Access to active workstations:

Among participants working in general practice, 5.6% reported having access to an active workstation, such as a standing desk. These participants reported lower average overall workday sedentary time (7.88 hours (SD 3.2)) than those that did not have access to an active workstation (10.47 hours (SD 2.88)) (MD 2.58 hours, 95% CI 1.12 to 4.07, $p = 0.001$). There was no significant difference in average age between participants that had active workstations (39.0 years (SD 10.9 years)) and those that did not (40.8 years (SD 10.2)) (MD 1.8 years (95% CI -3.19 to 6.87, $p = 0.472$)). There was also no significant difference in non-workday sedentary time between participants that had active workstations (4.36 hours (SD 2.67)) and those that did not (4.88 hours (SD 3.12)) (MD 0.52 hours (95% CI -0.50 to 1.11, $p = 0.304$)). Participants working 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 to 2.06, $p = 0.985$). Summary questionnaire data regarding active workstations is found in Table 3.

Attitudes regarding active workstations:

Among participants working in general practice who did not have access to an active workstation, 86.0% stated that they would consider using one in future. These participants had a younger average age (40.2 years (SD 9.7)) than those who would not consider an active workstation (45.3 years (SD 12.1)) (MD 5.16 years, 95% CI 0.89 to 9.43, $p=0.019$).

Attitudes regarding sedentary behaviour:

Among participants working in general practice, 87.0% reported they would prefer less time sitting, 11.9% would prefer the same time sitting and 1.1% would prefer more time sitting on a typical workday in general practice. Those who would prefer less time sitting had higher levels of workday sedentary time (10.68 hours (SD 2.7)) than those who would prefer the same time sitting (7.93 hours (SD 3.45)) (MD 2.75 hours, 95% CI 1.48 to 4.00, $p<0.001$) and those who would prefer more time sitting (8.67 hours (SD 6.1)) (MD 2.02 hours, 95% CI -13.11 to 17.14, $p=0.626$). Among those who would prefer the same amount of time sitting, 19.0% had access to an active workstation, while among those who would prefer less time sitting, only 4.9% had access to an active workstation. None of those who would prefer more time sitting had access to an active workstation.

Changes due to COVID-19:

Among participants working in general practice, 80.7% reported spending more time sitting, 13.9% reported the same time sitting and 5.4% reported less time sitting at work than prior to the COVID-19 pandemic. Among those who reported more time sitting, the main reasons given were: remote consulting, with less face-to-face interaction with patients and colleagues; working remotely due to shielding requirements; less home visits; less freedom to walk around within the practice or outdoors with colleagues; educational sessions taking place remotely. Among those who reported less time sitting, the main reasons given were: standing or walking while consulting remotely; using an active workstation; greeting patients in the waiting room instead of using a call-system; having to don and doff personal protective equipment.

Table 3. Summary questionnaire data for GPs and GPSTs working in general practice

	Do not have active workstation	Have active workstation	Significance	Overall population
Total	302 (94.4%)	18 (5.6%)		
Gender (Female/Male)	173 (60.9%) / 111 (39.1%)	13 (72.2%) / 5 (27.8%)	$\chi^2(1, N=302)=0.915, p=0.339$	204 (61.6%) / 127 (38.4%)
Average age (years)	40.8 (SD 10.1)	39.0 (SD 10.6)	MD 1.8 (95% CI -3.19 to 6.87, $p=0.472$)	40.7 (SD 10.2)
Average overall workday sedentary time (hours)	10.47 (SD 2.88)	7.88 (SD 3.2)	MD 2.58, 95% CI 1.12 to 4.07, $p=0.001$	10.33 (2.97)
Average overall non-workday sedentary time (hours)	4.88 (SD 3.12)	4.36 (SD 2.67)	MD 0.52 (95% CI -0.50 to 1.11, $p=0.304$)	4.78 (3.02)

4.3.2 Accelerometer study

Sample demographics:

Of the 353 participants who accessed the initial online questionnaire survey, 195 consented to being approached for the subsequent accelerometer study. In total, 46 survey participants were invited by email to participate in the accelerometer study. These participants were chosen purposively to ensure a maximally varied sample, based on their demographic criteria (age, gender, work pattern/environment) and self-reported sedentary time. The accelerometer study

invitation email received no response from 17 participants from the initial online survey. Of the 29 survey participants who responded to the accelerometer study invitation email, nine did not meet the inclusion criteria: four were on annual leave; two declined to participate; two participated in contact sports; one had a medical comorbidity. The summary details of the accelerometer study participants are compared with the questionnaire survey participants in Table 4.

Table 4. Questionnaire survey and accelerometer study participant comparisons

	Questionnaire survey	Accelerometer study
Average age (years)	39.9 (SD 10.3)	39.1 (SD 9.7)
Gender (Female / Male)	204 (61.6%) / 127 (38.3%)	12 (60%) / 8 (40%)
Job role (GP / GPST)	259 (74.2%) / 90 (25.8%)	16 (80%) / 4 (20%)
GP clinical sessions/week	6.29 (SD 1.76)	6.65 (SD 1.53)
Access to active workstation (No / Yes)	302 (94.4%) / 18 (5.6%)	16 (80.0%) / 4 (20.0%)
Average self-reported workday sedentary time (hours)	10.33 (SD 2.97)	9.80 (SD 3.19)
Average self-reported non-workday sedentary time (hours)	4.78 (SD 3.02)	4.38 (SD 2.65)

Data capture and analysis:

After being posted to participants, all accelerometers were programmed to record simultaneously during the time period from 00:01 on 15/10/2020 until 00:01 on 24/10/2020. All accelerometers and sleep/work logs were returned to the investigators, however not all accelerometers were worn by participants during the study period. Two participants reported

that they forgot to wear the device, while one participant reported being unable to effectively affix the device to their thigh.

Weather, daylight and COVID-19 restrictions:

Weather conditions were similar for all participants during the study period, as Northern Ireland has a relatively small geographical area of 14,120 km² (132). Weather recordings from Magherafelt, a town in the centre of Northern Ireland, showed that the temperature ranged from 5-13°C during the study period. There were three days with no precipitation, and between 1-22mm of rain on the other days. Daily hours of daylight ranged from 10.53 hours at the start of the study to 9.97 hours at the end of the study. COVID-19 restrictions were the same for all participants during the study period. Outdoor exercise areas such as parks and sports pitches were open, and gyms were open for individual training only. Participation in team sports was prohibited from 16/10/2020 until the end of the study.

Comparison of accelerometer and self-reported data:

Of the 17 participants who successfully wore the accelerometer during the study period, two were excluded from the comparison of their accelerometer data with their self-reported data. Both of these participants were unwell and did not work in the GP setting during the study period. Objective, accelerometer data were compared with subjective, self-reported data for the remaining 15 participants, and summarised in Table 5. Average self-reported overall workday sedentary time for these participants was 9.83 hours (SD 3.45). Their average accelerometer-measured overall workday sedentary time was 10.0 hours (SD 1.69), showing there was no statistically significant underestimation of their overall workday sedentary time (by 0.17 hours (95% CI -1.86 to 2.20, p=0.865)). For a non-workday, average self-reported overall sedentary time was 4.53 hours (SD 2.55). Their average accelerometer-measured overall non-workday sedentary time was 7.20 hours (SD 1.88), showing they had significantly underestimated their overall non-workday sedentary time by 2.67 hours (95% CI 0.99 to 4.35, p=0.003).

Table 5. Comparison of accelerometer-measured and self-reported sedentary time

	Self-reported	Accelerometer-measured	Mean Difference
Average workday sedentary time (hours)	9.83 (SD 3.45)	10.00 (SD 1.69)	0.17 hours, 95% CI -1.86 to 2.20, p=0.865
Average non-workday sedentary time (hours)	4.53 (SD 2.55)	7.20 (SD 1.88)	2.67 hours, 95% CI 0.99 to 4.35, p=0.003

Active workstations:

Participants with access to an active workstation had an average of 7.57 hours (SD 0.56) of overall workday sedentary time. This was significantly less than those without an active workstation, who averaged 10.88 hours (SD 0.82) of overall workday sedentary time (MD 3.32 hours, 95% CI 2.36 to 4.28, p<0.001). Participants with access to an active workstation had significantly more overall workday standing time than those who did not have an active workstation (5.81 hours (SD 1.39) vs 2.88 hours (SD 0.79), MD 2.93 hours, 95% CI 1.71 to 4.14, p<0.001). Participants with active workstations had similar average overall workday LPA (3.53 hours (SD 1.23) vs 3.28 hours (SD 0.79), MD 0.24 hours, 95% CI -1.39 to 0.91, p=0.659), MVPA (0.34 hours (SD 0.20) vs 0.37 hours (SD 0.34), MD 0.03 hours, 95% CI -0.36 to 0.43, p=0.852), and step counts (5145.19 (SD 497.8) vs 5331.09 (SD 979.24), MD 185.90, 95% CI -3457.43 to 3829.22) to those without active workstations. Accelerometry-measured data regarding active workstation access is summarised in Table 6.

Table 6. Comparison of accelerometry-measured data regarding active workstation access

	No access to active workstation	Access to active workstation	Mean Difference

Average workday sedentary time (hours)	10.88 (SD 0.81)	7.57 (SD 0.56)	3.31 (95% CI 2.36 to 4.28, p<0.001)
Average workday standing time (hours)	2.88 (SD 0.79)	5.81 (SD 1.39)	2.93 (95% CI 1.71 to 4.14, p<0.001)
Average workday light physical activity (LPA) (hours)	3.28 (SD 0.79)	3.53 (SD 1.23)	0.25 (95% CI -1.39 to 0.91, p=0.659)
Average workday moderate to vigorous physical activity (MVPA) (hours)	0.37 (SD 0.34)	0.34 (SD 0.20)	0.03 (95% CI -0.36 to 0.43, p=0.852)
Average workday step count (steps)	5331.09 (SD 3096.62)	5145.19 (SD 862.29)	MD 185.90 (95% CI -3651.33 to 3279.53, p=0.910)

Workdays vs non-workdays:

Average overall sedentary time for all participants was significantly higher on workdays (10.0 hours (SD 1.69)), than non-workdays (7.20 hours (SD 1.88)) (MD 2.80 hours, 95% CI 1.46 to 4.1370, p<0.001). There was no significant difference in average overall standing time on workdays (3.66 hours (SD 1.58)) and non-workdays (4.18 (SD 1.32)) (MD 0.52 hours, 95% CI -0.57 to 1.61, p=0.336). Average overall LPA was significantly lower on workdays (3.36 hours (SD 0.86 hours)) than on non-workdays (4.26 hours (SD 1.26)) (MD 0.90 hours, 95% CI 0.09 to 1.71, p=0.030). Average overall MVPA was significantly lower on workdays (0.36 hours (SD 0.29)) than on non-workdays (1.02 hours (SD 0.41)) (MD 0.66 hours, 95% CI 0.39 to 0.93, p<0.001).

Average overall step count was also significantly lower on workdays (5281.51 (SD 2690.17)) than on non-workdays (10890.89 (SD 4063.56)) (MD 5609.38, 95% CI 3597.21 to 7621.55, $p < 0.001$).

COVID-19:

One participant wore their accelerometer despite having to self-isolate at home during the entirety of the study period due to COVID-19 regulations. Their accelerometer data was therefore not included in the overall analysis, however this participant had the highest average daily sedentary time of all participants (17.01 hours (SD 1.36)), as well as among the lowest average time spent in LPA (2.68 hours (SD 0.44)) and MVPA (0.29 hours (SD 0.18)) each day. This participant had previously self-reported their typical overall sedentary time to be 7.00 hours on a workday and 2.00 hours on a non-workday.

4.4 Discussion

4.4.1 Summary

This is the first study to examine levels of sedentary behaviour among GPs using both subjective (self-reported) and objective (accelerometer-measured) data. On average, participants had significantly higher overall sedentary time on workdays compared to non-workdays, even when accounting for inaccuracy due to underestimation. When comparing subjective, self-reported sedentary time with objective, accelerometer-measured sedentary time, participants did not statistically significantly underestimate their overall workday sedentary time, but did statistically significantly underestimate their non-workday sedentary time. Those working in general practice had significantly higher levels of workday sedentary time than those working in secondary care settings. The 5.6% of participants in general practice with active workstations had similar levels of workday sedentary time to those working in secondary care. Those with active workstations primarily replaced sedentary time with standing time. Although GPs now have higher levels of workday sedentary time than prior to the COVID-19 pandemic, mainly due

to the increase in remote consulting, most would prefer to have less workday sedentary time. Despite only a small minority of GPs currently having access to active workstations, a large majority, particularly those younger in age, would consider using active workstations in future.

4.4.2 Comparison with existing literature

In a recent systematic review, conducted by the authors, just two studies were identified relating to levels of sedentary behaviour among GPs (133). In a study of GP trainers and GP trainees in the Republic of Ireland in 2018, 60% of GPs and GPSTs reported spending in excess of seven hours sitting each day, 24% between four and seven hours, and 16% less than or equal to four hours (9). In a study of female GPs in Estonia in 2010, average daily sitting time was 6 hours and 36 minutes, with 56% of participants reporting more than 6 hours of daily sitting time (10). Both studies primarily examined physical activity of GPs using the International Physical Activity Questionnaire (IPAQ) (9, 10). In the IPAQ just one question concerns sedentary behaviour, where participants are asked how much time they usually spend sitting on a weekday, on average over the previous seven days (109). This may have led to both studies underestimating true levels of sedentary behaviour, as sedentary behaviour also includes when an individual is awake in a lying or reclining posture, and single-item questions are less reliable than multi-item questionnaires for the assessment of sedentary time (117). As shown in our questionnaire survey, most GPs do not work in general practice every weekday, with participants working an average of 6.09 (SD 1.75) sessions per week in the general practice setting. Many GPs also work in out of hours settings at weekends. By not differentiating between a workday and a non-workday, previous studies may have underestimated sedentary time, whereas in our study participants were asked to separately estimate their sedentary time on a workday and a non-workday, using a multi-item questionnaire. Both previous studies took place prior to the COVID-19 pandemic, which has resulted in significant, potentially longstanding changes to the working conditions of many GPs (134). As our study took place in autumn 2020, our findings reflect the increased levels of remote consulting in the general practice setting brought about by the COVID-19 pandemic (135), with a corresponding increase in sedentary time.

When comparing subjective, self-reported sedentary time with objective, accelerometer-measured sedentary time, participants in the accelerometer study did not statistically significantly underestimate their workday sedentary time (by 0.17 hours (95% CI -1.86 to 2.20, $p=0.865$)), but did significantly underestimate their non-workday sedentary time (by 2.67 hours (95% CI 0.9 to 4.35, $p=0.003$)). This correlates with previous studies finding self-reported sedentary time to be more accurate on a workday than on a non-workday (113, 117, 136). This may be because workdays follow a more reliable, predictable structure and routine than non-workdays, which may be less structured and more variable.

Findings from this study show that on average, most GPs currently have over ten hours of total sedentary time over the course of each workday. This correlates with previous research demonstrating that workers among higher socioeconomic classes typically have high levels of sedentary behaviour and low levels of physical activity (137), with GPs and GPSTs in general practice having similar levels of sedentary time to workers in the education, telecom and service industries (105). This is a concerning finding given the established dose-response relationship between sedentary time and mortality (25-28, 138-140). In a harmonised meta-analysis examining the association between accelerometer-measured physical activity and sedentary time and all-cause mortality among nearly 40,000 participants, mortality increased gradually between seven and nine hours, and more pronouncedly at greater than nine hours of total daily sedentary time (138). In the same study, ten and a half hours of daily sedentary time was associated with a significantly higher risk of death (Hazard ratio 1.48 (95% CI 1.22 to 1.79)) than the reference level of seven and a half hours (138). For GPs and GPSTs working in secondary care settings, or in general practice with active workstations, their average overall workday sedentary time of less than eight hours could potentially make them less likely to be affected by the adverse health outcomes associated with excessive sedentary behaviour. On workdays, these participants were more aligned with the 2020 WHO physical activity and sedentary behaviour guidelines by minimising their sedentary behaviour (141). In 2020, Canada was the first country to make specific recommendations regarding total daily sedentary time (142). On workdays, GPs and GPSTs working in secondary care settings, or in general practice with active workstations, adhered to the Canadian 24-hour movement guidelines advising

adults to have less than eight hours of total daily sedentary time (142), while their colleagues working in general practice without active workstations did not. This supports previous studies showing that interventions involving active workstations can be effective in reducing sedentary time among desk-based workers (1, 5, 143-146). The fact that older GPs were less likely to consider using an active workstation than their younger colleagues aligns with previous research demonstrating that although openness to experience increases in emerging and middle adulthood, it decreases from middle adulthood onwards (147, 148).

On non-workdays, GPs averaged less than eight hours of total daily sedentary time, regardless of their workday sedentary time and working environment. Accelerometer-measured data from this study demonstrates that GPs and GPSTs have high levels of physical activity, particularly on non-workdays. Previous research regarding physical activity of GPs has varied depending on study methodologies and locations (9, 10, 51, 55-58), however this has never previously been measured using accelerometers. On non-workdays, GPSTs had higher levels of sedentary time than GPs. This may be due to the need for GPSTs to study, typically done while seated, for postgraduate exams required for completion of GP specialty training (149, 150).

Within the accelerometer study, the participant having to self-isolate due to COVID-19 regulations had very high levels of sedentary time, averaging over 17 hours per day. This aligns with previous research showing increased levels of sedentary behaviour and reduced levels of physical activity among people affected by COVID-19 lockdown and self-isolation requirements (151). The overall increase in workday sedentary time among most participants in light of the COVID-19 pandemic also corresponds with recent research demonstrating that social distancing and increased teleworking likely contribute to increasing sedentariness (152).

4.4.3 Strengths and limitations

Using an initial online survey allowed the questionnaire to be widely disseminated among GPs and GPSTs throughout Northern Ireland. This maximised the likelihood that all potential participants were able to access the questionnaire and was less onerous than completing a paper-based, postal survey. Multi-item questionnaires with a relatively short recall period are

more reliable than single item questions and longer recall periods for the assessment of sedentary time and have been used extensively to determine levels of sedentary behaviour among large population groups (26). Thigh-worn accelerometers are highly accurate for distinguishing between sedentary behaviour (such as sitting or lying down) and other behaviours (such as standing and stepping) (29). Using accelerometers with an accompanying sleep/work log among a smaller, purposive sample of participants allowed comparison of subjectively and objectively reported levels of sedentary time and comparison of sedentary time, physical activity and step counts between workdays and non-workdays.

The survey response rate of 17.7% is similar to previous online surveys among GPs (9, 10, 153). Higher response rates have previously been obtained by postal surveys (51, 153), however this may have caused increased hassle for participants, particularly in light of concerns regarding higher workload during the COVID-19 pandemic (154). The relatively low response rate means that participants may not have been truly representative of all GPs and GPSTs in Northern Ireland at the time of the study. Thigh-worn accelerometers are unable to detect upper body movement, so if a participant was sitting, reclining or lying while performing exercise involving the trunk or arms, this may incorrectly have been recorded as sedentary behaviour. Participants in the accelerometer study may have modified their behaviour while they were wearing the device, a phenomenon known as the Hawthorne effect, however the significance of this is uncertain and is shared with other studies using accelerometers, pedometers and similar devices for the objective measurement of sedentary behaviour and physical activity (155, 156).

4.5 Conclusion

This study demonstrates that GPs and GPSTs working in general practice typically have high levels of sedentary time on workdays, with significantly lower amounts of sedentary time 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 lifestyle choices. In-depth, qualitative research focusing on the enablers and barriers to GPs reducing their workday sedentary time and increasing their workday physical activity would shed more light on the acceptability and feasibility of future interventions in this area.

Chapter 5 - GPs' perspectives regarding their sedentary behaviour and physical activity: a qualitative interview study

5.1 Aims

The aims of this study were to conduct qualitative, semi-structured interviews with GPs, and use deductive thematic analysis to map their perspectives onto 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 (157). Specific focus was placed on identifying:

- Their knowledge of health outcomes related to sedentary behaviour and physical inactivity;
- Their own levels of sedentary behaviour and physical activity;
- The barriers and facilitators influencing their levels of sedentary behaviour and physical activity;
- The potential of workplace interventions to reduce sedentary behaviour and increase physical activity;
- How their own health behaviours affect their interactions with patients.

5.2 Methods

5.2.1 Design

During autumn 2020, an online questionnaire based on the International Sedentary Assessment Tool (ISAT) (127), was distributed to all GPs and General Practice Specialty Trainees (GPSTs) throughout Northern Ireland using email and social media, as described in Chapter 3 (158). 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). Twenty questionnaire participants were recruited to a subsequent accelerometer and interview sub-study, with purposive selection 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 Axivity (Newcastle-upon-Tyne) AX3 accelerometer (validated for the detection of sitting, lying, standing and light, moderate and vigorous physical activity (129)) 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 advised that they would be informed of their average workday and non-workday sedentary time, standing time, light physical activity, moderate to vigorous physical activity, and step count, and asked questions relating to sedentary behaviour and physical activity.

5.2.2 Data collection

One of the authors (RSM), a male academic GPST with previous experience in qualitative research, who had recruited the participants to the previous questionnaire and accelerometer studies, conducted in-depth semi-structured interviews over webcam (Microsoft Teams) during May and June 2021. The interview guide (Appendix 4) had previously been piloted with an academic GP and minor revisions were made to the questions after the first two interviews were conducted. The interview schedule addressed topics such as how participants felt about their own levels of sedentary behaviour and physical activity inside and outside of work, awareness of health risks related to sedentary behaviour and physical activity, and possible interventions to reduce workday sedentary behaviour and increase physical activity. All participants had previously provided informed consent for the interviews, which lasted between 21 and 32 minutes in duration.

5.2.3 Analysis

Interviews were recorded digitally and transcribed verbatim by the interviewer (RSM). Audio recordings and transcriptions were stored securely using password protection and were only available and accessible to the research team. Transcripts were coded within NVivo (version 12), using deductive thematic analysis (159) to map viewpoints relating to GP sedentary behaviour and physical activity behaviour change onto relevant domains from the TDF (160,

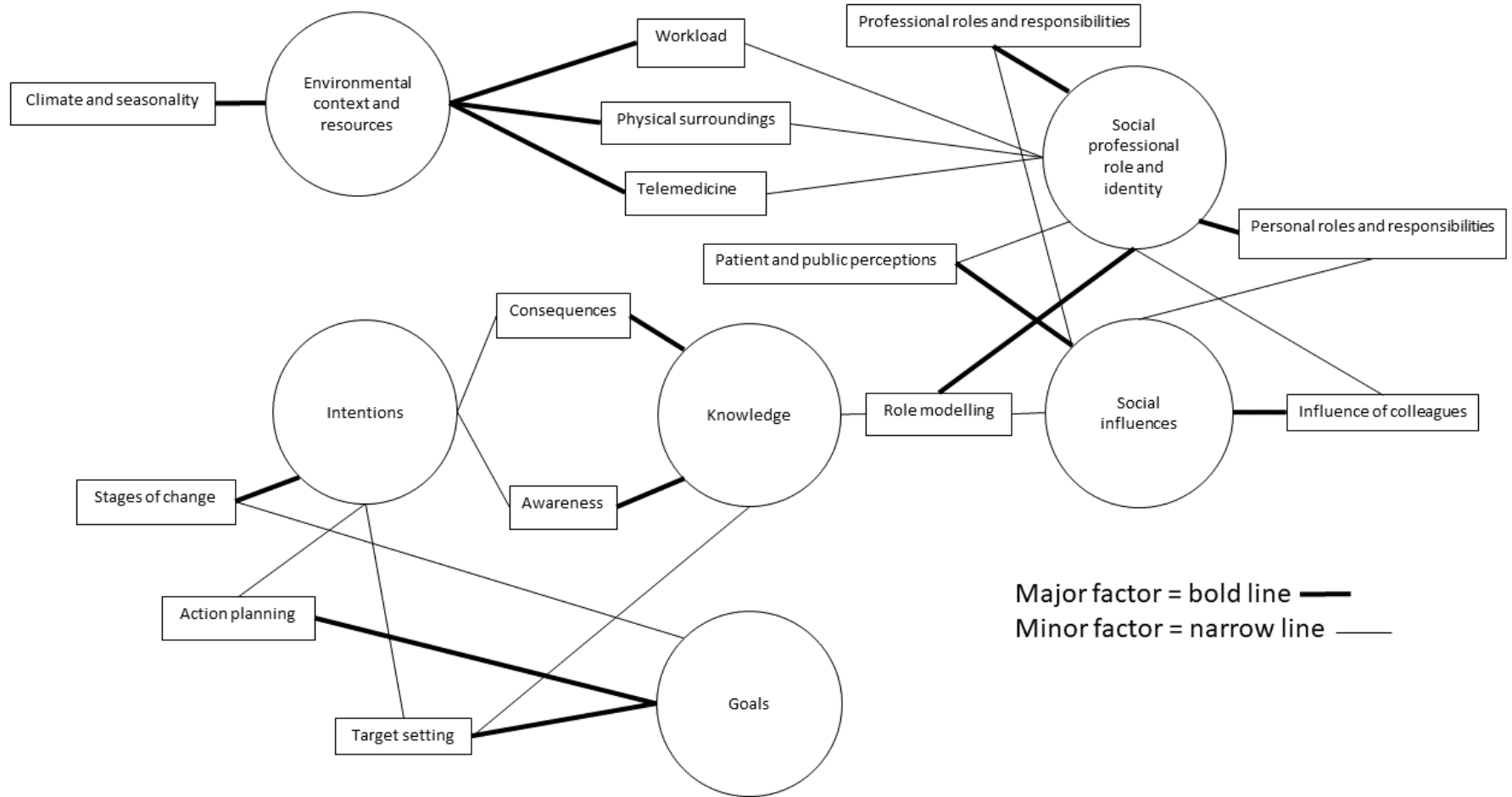
161). This study used the second version of the TDF, which was created after validation of the original TDF, and comprises 14 domains covering 84 theoretical constructs including social, environmental, cognitive, and affective components (161). Subsequent inductive analysis was undertaken to create explanatory sub-themes within the previously identified domains within the TDF (162). Independent analysis of a random sample of three interviews was initially undertaken by a second researcher (NH), who is a dual qualified clinical academic GP and consultant in sport and exercise medicine. Differences in coding were discussed before a consensus was reached to ensure appropriateness of domain mapping and creation of sub-themes. The study was conducted in accordance with the consolidated criteria for reporting qualitative research (COREQ) checklist (163).

5.3 Results

Ten GPs and three GPSTs participated in the interviews, comprising nine females and four males. Saturation of the main themes was reached after the 12th interview, as no new emerging themes were identified, however a further interview was conducted to maximise participant diversity. 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 recorded between 7.85 and 12.47 hours of average workday sedentary time during the preceding accelerometer sub-study. Key areas emerging from the interviews were categorised within six theoretical domains, with sub-themes within each. The first theoretical domain was “environmental context and resources.” The sub-themes in this domain were workload, climate and seasonality, physical surroundings and telemedicine. The second theoretical domain was “social professional role and identity,” comprising professional roles and responsibilities, personal roles and responsibilities, and role modelling as sub-themes. The third theoretical domain was “goals,” with sub-themes of target setting and action planning. “Social influences” comprised the fourth theoretical domain, incorporating the influence of colleagues, and patient and public perceptions as sub-themes. The fifth theoretical domain was “knowledge,” with consequences and awareness as sub-themes. The final

theoretical domain was “intentions”, with stages of change being a sub-theme. A map was used to identify the emerging relationships between domains and sub-themes, which identifies strengths (major or minor factor) of the respective relationships and where they overlapped and interacted (Figure 3) (159)

Figure 3. Explanatory map of key TDF domains and sub-themes influencing GP sedentary behaviour and physical activity



1) TDF Domain: Environmental context and resources

This is defined “as any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour” (161).

1.1) Sub-theme: Workload

All participants identified workload as a key barrier to reducing sedentary behaviour and increasing PA. The working day is extremely busy, with limited time for breaks, impacting the time available to leave the consulting room. This was true for both GPSTs and GPs, as well as those working in urban, suburban and rural environments.

One participant identified how the time taken for non-patient facing tasks often spilled over into the lunchbreak, which limited the opportunity for physical activity breaks.

“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.

Another participant identified how GPs can be reluctant to move away from their desk due to time pressures.

“I often intend to go for a walk for 20 minutes at lunchtime, but sometimes the workload is so heavy that you think, well, if I go for a walk for 20 minutes at lunchtime, I’m going to be staying 20 minutes later at work... Some GPs, and I suppose I’m tempted now, bring a flask and have a cup of tea at their desk rather than having to walk down to the kitchen and waste five minutes doing that, you know, it’s just, it’s just the time pressure, isn’t it?” GP111, male.

Time taken to walk to the waiting room to greet patients was felt to be a deterrent for some participants.

“If I wasn’t in the room which is the furthest from the waiting room, I might consider it... I think the human touch is very good, but yeah, by the time I walk to the waiting room and walk back again it takes too long.” GP 110, male.

1.2) Sub-theme: Climate and seasonality

Like the general population, weather and seasonal factors affected willingness of participants to engage in PA. This was especially relevant given the relatively wet weather in Northern Ireland (164).

One participant cited being deterred by cold conditions:

“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.

Another participant identified wet weather as a barrier to physical activity during the lunchbreak, instead opting to continue with work-related tasks.

“If it’s wet and dreary, I probably prefer just to push on with some work rather than head out to walk and get soaked.” GP102, female.

1.3) Sub-theme: Physical surroundings

The built and natural environment in and around the workplace influenced PA. One participant, a GP partner, cited a small building as limiting the opportunity for movement.

“It’s a really tiny practice, so we don’t have long corridors or stairs or anything like that.” GP108, female.

Another participant, a GPST, identified the area surrounding their workplace as being either a positive or a negative influence on their desire to walk when they had the opportunity.

“When I was in my previous practice, I sometimes would have gone out for even a 15-20 minute walk. There was a small walkway by the practice I was working at. So sometimes would have done that just to clear the head but there’s not really the same opportunities to do that in my current workplace... It wouldn’t be the most appealing place to go for a walk whereas the

country practice I was in before had a dedicated eco-garden and walkway which was quite pleasant.” GP 113, male.

Another participant had considered installing a height-adjustable sit-stand desk, but was deterred by the layout of their room.

“Just the way my room is set up, we have shelves above our desks so... I thought there was going to be a lot of hassle, trying to practically install it.” GP 102, female.

Physical surroundings are especially relevant for GP partners who often work in the same building for many years. They can potentially have a degree of control over their physical environment, such as installing a sit-stand desk in their consulting room, which GPSTs and sessional GPs may be unable to do. GPSTs and sessional GPs, however, typically work in a range of different locations, meaning they can encounter more variety in the built and natural environments where they are working.

1.4) Sub-theme: Telemedicine

Remote consulting was identified by many participants to be a cause of excessive sedentary time. This is particularly relevant now that GPs provide a high volume of remote consultations, traditionally performed while sitting down, which were initially a way of providing safe patient care at the outset of the COVID-19 pandemic, but will likely remain a permanent part of general practice moving forwards (118, 135).

“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.

One participant even felt that telemedicine was having a noticeable effect on the physique and behaviour of GPs.

“At the moment telephone triage is making us all slower and fatter.” GP110, male.

However, some recognised the possibility of telemedicine to allow an increase in physical activity.

“If you wanted to make changes you could use (telemedicine) as a positive. Because obviously if you do a telephone consultation, you could make a handstand or lie in your bed or sit or stand, whatever, you know, it wouldn’t make much of a difference. It would be different, of course, if you have a video consultation. Then you also need to have a comfortable relaxed body language, which is probably better to achieve when you’re sitting. But if it’s just a plain telephone consultation, you could do it standing.” GP104, male.

2) TDF Domain: Social professional role and identity

This encompasses “a coherent set of behaviours and displayed personal qualities of an individual in a social or work setting” (161).

2.1) Sub-theme: Professional roles and responsibilities

Some participants’ beliefs about their professional roles influenced their perceptions regarding 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.

“There’s no sort of (physical) activity throughout the day... It’s just constant. I’m sitting on my bum from half eight until half one, eat my lunch at my desk and sit again till six. There’s literally no activity in my day at work.” GP109, female.

2.2) Sub-theme: Personal roles and responsibilities

Family commitments, particularly among participants with young children, were identified as limiting the time available for physical activity.

“Young kids don’t make it easy. There’s always other things to pull away your time.” GP102, female.

“(At the end of the working day) I would rather get home and see the kids and plan to do some exercise after they’re in bed. But you feel less inclined at eight o’clock at night to do that.”

GP111, male.

Some personal roles were identified as having a positive influence on physical activity, such as having a pet dog. This aligns with previous research which demonstrated that dog ownership is associated with increased physical activity (165-169). However, just two participants mentioned that they owned a dog. This may be due to high workload and long core working hours of 08:00-18:30 each weekday (170), which may make GPs feel less capable of owning a dog than people working in other occupations.

“If I didn’t walk the dog every morning... my step count would be absolutely dire. And it’s the one thing that does sort of keep me more active, I think.” GP108, female.

2.3) Sub-theme: Role modelling

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.

“Those who come to GPs are very often those who are less fortunate in life. So, I think if you are too high up there, it’ll be very difficult for somebody who’s inactive and overweight to admit to that if every GP they go to is the embodiment of physical health. Of course, it has to be a bit of a balance. If you come to your GP and he’s still smoking and has a glass of whiskey on his desk, that’s probably not so good an idea.” GP104, male.

“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.” GP 118, female.

3) TDF Domain: Goals

These are the “mental representations of outcomes or end states that an individual wants to achieve” (161).

3.1) Sub-theme: Target setting

Many participants monitored their levels of physical activity, such as with mobile phone apps or wrist-worn activity trackers, and set targets for themselves, which were generally deemed to be helpful.

“I'm trying, if possible, to get above this 10,000 steps a day, whatever good that may bring. And I'm so far on average, probably three times a week, I'm able to do that.” GP104, male.

However, one participant identified how having a goal for physical activity could be problematic if they felt unable to achieve it.

“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.

Monitoring technology was equally prevalent among male, female, younger and older participants, which reflects how most members of society are becoming increasingly technology literate over time (172).

3.2) Sub-theme: Action planning

Some participants deemed that prioritising physical activity was essential for physical and mental wellbeing, however some views could potentially be seen as being judgemental of people deemed not to be meeting physical activity recommendations.

“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... 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.

"If people are determined they will always find time to do things. But they have to find that time, they have to commit to it, and they have to sacrifice sitting in front of the TV." GP118, female.

4) TDF Domain: Social influences

This represents the "interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours" (161).

4.1) Sub-theme: Influence of colleagues

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. This was valid for both GP partners and GPSTs, despite the expectation that partners would feel more deeply imbedded and established in their practices, and thus potentially less likely to be influenced by others.

"(Getting out for lunchtime walks) was quite nice actually. You know, it was nice surroundings as well, so that was great and just doing it together meant that there was like a peer drive to go." GP119, female.

"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.

4.2) Sub-theme: Patient and public perceptions

How participants felt they were viewed by patients and members of the public were important factors when they were deciding on the pros and cons of engaging in physical activity, particularly near where they worked. This overlapped with the role modelling sub-theme, as described above. The balance of being a positive role model for physical activity among patients

and colleagues, such as by getting out to exercise during the lunchbreak, clashed with the perception of needing to be seen to be working hard by the general public.

“The problem is also because you’re right in the middle of the community. If they see the doctor out taking a walk they’ll think, “Oh they’re not that busy,” you know, “they’ve got time to be walking down the beach every day,” you know. I mean, “My goodness, what are they being paid for?” So, I don’t know. There’s that sort of balance sometimes. You know, if I were to be out, I kind of almost don’t want to see any of the patients, but you know, it’s very unlikely that if you’re out in the middle of the day, you’re not going to bump into, you know, everyone you bump into is going to be your patient. And even though you might not recognize them, they certainly will recognize you.” GP108, female.

“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... so it’s a bit easier to be anonymous.” GP113, male.

5) TDF Domain: Knowledge

This is “an awareness of the existence of something” (161).

5.1) Sub-theme: Consequences

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

“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.

“Almost every condition is made worse by lack of physical activity... but obviously particularly cardiovascular risk and metabolic syndrome and diabetes. But then even things like mental

health problems, depression, anxiety, and so on. Any chronic disease really is. You're increasing your risk by a lack of physical activity.” GP111, male.

This is likely a further source of internal conflict for many GPs, who are aware of the benefits of physical activity for their own health and wellbeing, but not always able to achieve the recommended levels of physical activity for various reasons described above.

5.2) Sub-theme: Awareness

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 (173), where practices can link with a local parkrun (free, volunteer-led community initiative where people walk or run a timed 5km route each week). However, only one participant (7.7%) had heard of the RCGP Active Practice Charter (174), where practices sign up to an initiative aiming to reduce sedentary behaviour and increase physical activity among patients and staff. At the time of the study, no practices in Northern Ireland were signed up to the RCGP Active Practice Charter, whereas there were over 100 practices signed up across the rest of the UK. Some participants were also sceptical about the effectiveness of these interventions and initiatives. This aligns with research showing that people are more likely to maintain positive health behaviours if they make them habitual, and that high levels of physical activity are required to offset the harms of excessive sedentary behaviour (138, 175).

“I'm always a bit cautious if you have an initiative which, em, tries to get people to do one thing or whatever, you know. I think it's better if you are able to integrate things into your daily routine... For example, like your (commute) to work. Once you change that, you can either walk or cycle and if that becomes a habit then that's for life, you know. Likewise, if at work if you establish that, “Right, when I finish seeing my patients and I look at my results, that's when I stand up,” or, “I do that on a different computer where I have to stand,” I think then there's a better chance that you maintain it. Rather than if you have an initiative which runs out at some stage.” GP104, male.

“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.

6) TDF Domain: Intentions

This is when someone makes a “conscious decision to perform a behaviour or resolves to act in a certain way” (161).

6.1) Sub-theme: Stages of change

All participants had different levels of motivation regarding their willingness to change their levels of sedentary behaviour and physical activity. Individuals typically cycle between stages of change at different time points depending on internal and external factors throughout their life course (176).

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.”

5.4 Discussion

5.4.1 Summary

Despite widespread awareness among GPs of the health risks associated with physical inactivity, and of the current UK physical activity guidelines, they identified many barriers that hindered their own abilities to reduce their sedentary behaviour and increase their physical activity. These included workload, personal and professional roles and responsibilities, and physical infrastructure. Several factors were seen as being enablers for some, and barriers for others. These included telemedicine, the local environment, social influences, patient and public perceptions, and climate and seasonality. GPs did recognise their potential to be positive role models in encouraging patients and colleagues to become more physically active. They were aware that for this advice to seem credible to patients, GPs should aim to be less sedentary and more physically active themselves. The idea of GPs being a positive role model for physical activity was tempered, however, by concerns of a negative public perception if GPs were seen to be taking breaks for physical activity during the working day, especially due to present concerns around patient access and primary care workload. It therefore appears that many GPs do not currently feel able to adopt the role of being a positive physical activity role model to their patients, which represents a missed opportunity for healthy lifestyle promotion and the associated benefits this could entail (177).

5.4.2 Comparison with existing literature

Findings from this study align with similar previous research among other population groups both inside and outside the field of medicine. Despite many GPs having good knowledge of physical activity guidelines, counselling patients about the benefits of physical activity is often a low priority compared to other health behaviour modifications (178). Therefore, although GPs could be in an optimal position to counsel their patients about the health benefits of physical activity, this does not currently appear to be being realised (178). In a cross-sectional survey of GPs in the Republic of Ireland, time pressures, lack of energy, lack of suitable exercise facilities and environment, and competing roles and responsibilities were all identified as barriers to

them increasing their own physical activity (9). Similar findings were replicated among doctors and nurses working in India, with participants additionally reporting that they prioritised the health of their patients over their own health (179). Desk-based workers in other professions also identified similar barriers to increasing their physical activity, such as workload, workplace culture, social norms, and public perceptions (180). Cultural and social factors were also important among other population groups, such as university students (149) and older adults (181), demonstrating that these are relevant considerations across the life course.

Numerous positive aspects relating to physical activity were identified in this study, including both physical and mental health benefits. This corresponds with previous research examining motivations for participation in physical activity among other desk-based workers (180) and individuals across the lifespan (182). Lower levels of sedentary behaviour and higher levels of physical activity have been associated with reduced burnout and fatigue in a range of occupations, including other HCPs (183-190). In terms of enablers which helped participants to be more physically active, a positive workplace culture, self-monitoring, goal-setting, and social support were all identified by nurses in Queensland, Australia (191), which aligns with the findings from this study. In general, therefore, this study demonstrates that GPs have similar barriers and facilitators to increasing their physical activity as most other population groups, with the additional awareness and insight into how their current high levels of sedentary behaviour and physical inactivity are negatively affecting their own health. However, despite this knowledge, it appears that for many GPs there are more barriers, which play a stronger role than enablers, to them reducing their sedentary behaviour and increasing their physical activity. Changing general practice workplace culture through behaviour change interventions requires a complex, multi-layered process (192) which goes above and beyond the current offerings relating to physical activity promotion, however recent initiatives such as the RCGP Active Practice Charter can play a positive role (174).

Increasing evidence is emerging of the positive effects of interventions to reduce sedentary behaviour through improving biomarkers of cardiometabolic risk (193). Several studies have shown the efficacy of multicomponent interventions in helping to reduce sedentary time and

increase physical activity among desk-based workers (1, 2, 124). Co-production of “sit less at work” interventions, taking pragmatic approaches to reduce barriers to physical activity, appear promising among smaller workplaces, and could potentially be replicated among general practices in future (194, 195). Like other behaviour change interventions, for this to be successful in the general practice setting will require careful consideration of the many factors which contribute to change management at the individual and organisational level, to ensure that enablers to GPs reducing their sedentary behaviour and increasing their physical activity become stronger than the many barriers identified in this study (195, 196).

5.4.3 Strengths and limitations

This study provides detailed insights into the thoughts and opinions of GPs regarding their own sedentary behaviour and physical activity, with interviews conducted after participants had received detailed, personalised, objective feedback regarding their sedentary behaviour and physical activity throughout a seven-day period. Although many studies have previously focused sedentary behaviour and physical activity among patients and the general public, minimal previous research has examined this among GPs themselves. Although all participants were working in Northern Ireland at the time of the study, they had similar working conditions to their colleagues working within general practice across the rest of the UK.

This study only examined the perspectives of GPs and GPSTs, however more diverse views could potentially be identified by including other professions such as nurses, receptionists and allied health professionals working in the general practice setting.

Using deductive analysis to map responses to domains within the TDF meant that some responses could potentially have been mapped to more than one domain. However, when this was the case, the domain with most perceived relevance was chosen, as shown in Figure 3.

5.5 Conclusion

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 movement behaviours. High workload was identified as a key barrier to reducing sedentary time. Excessive workload can lead to burnout and fatigue among GPs, yet interventions to increase physical activity have been shown to reduce burnout and fatigue among HCPs. Further research should therefore explore the relationship between GP movement behaviours with burnout and fatigue.

Chapter 6 – The relationship between general practitioner movement behaviours with burnout and fatigue: an exploratory accelerometer-measured feasibility study

6.1 Aims

Physical inactivity is associated with burnout and fatigue (183-190, 197). Burnout is a work-related phenomenon characterised by a severe loss of physical and mental energy (198). Fatigue has been defined as an overwhelming sense of tiredness and exhaustion, with a lack of energy and associated impaired physical and/or mental functioning (199). Burnout, fatigue and poor wellbeing among HCPs are associated with reduced performance and patient-safety outcomes (200-204), yet burnout among GPs is consistently high across the globe (200, 201, 205-210). Workload and job pressures are key contributors to burnout and fatigue (200, 201, 205-211), with primary care workload increasing in recent years due to a mismatch between capacity and demand (212, 213). With primary care workload unlikely to reduce in the immediate future, it is important to consider other factors that can influence burnout and fatigue among GPs. Although lower levels of sedentary behaviour and higher levels of physical activity are associated with reduced burnout and fatigue in a range of occupations, including other HCPs (183-190), there is a lack of research investigating this question among GPs.

The primary aim of this study was to assess the feasibility of exploring the relationship between GP movement behaviours with their self-reported levels of burnout and fatigue. Secondary aims were to undertake a power calculation to determine the number of participants that would be needed for an intervention study aiming to reduce burnout and fatigue among GPs through a sedentary behaviour and physical activity behaviour change intervention, if relevant, and to explore GPs perspectives on how working in primary care affects their health and wellbeing.

6.2 Methods

6.2.1 Design

Participants for this study were initially enrolled using the online questionnaire (described in Chapter 3) during autumn 2020. All willing participants, who had previously completed the

questionnaire study, were subsequently approached regarding recruitment to this accelerometer and questionnaire study, which was conducted during spring 2021. They were advised that a thigh-worn accelerometer, worn affixed to their thigh continuously for one week, was the gold-standard in sedentary behaviour research, and would therefore provide more detailed data than self-reported data. They were also informed that their data would be pseudonymised and stored securely as per data protection regulations. ActivPAL micro (PAL Technologies, Glasgow, UK) accelerometers were used, which are highly accurate in measuring sitting, standing and number of steps when worn on the thigh (214). Recruited study participants were posted an accelerometer, adhesive waterproof dressings, and instructions detailing how to wear the accelerometer continuously, on the middle of the thigh, over a seven-day period while completing a contemporaneous sleep and work log. On completion, participants posted the accelerometer and sleep/work log back to the research team. While wearing the accelerometer, participants were also asked to complete an online questionnaire regarding their physical and mental wellbeing. This included the single item burnout question developed by Rohland and colleagues, which has been validated among physicians as a measure of burnout against the Maslach Burnout Inventory (215-217). This allows participants to rate their level of burnout from one to five, with ratings one and two representing no burnout and ratings three to five representing burnout of increasing severity (216). The questionnaire also included the 11-item Chalder Fatigue Scale, in which a global binary fatigue score of four or more represents severe fatigue (218, 219). Furthermore, participants were asked open questions exploring how working in general practice affected their health and wellbeing.

Inclusion and exclusion criteria:

Inclusion criteria were as follows: employment as a GP partner, salaried GP, sessional or locum GP, or GPST (GP specialty trainee) working in general practice in Northern Ireland; having completed the online sedentary behaviour questionnaire; and having consented to being approached for a subsequent accelerometer study. Exclusion criteria were as follows: having a comorbidity that the participant felt would affect sedentary time; being on annual leave during

the study; having participated in the previous accelerometer study, as described in Chapter 3 (220); and being involved in contact sports that could damage the accelerometer.

Analysis:

Accelerometer data were processed using Processing PAL (University of Leicester, Leicester, UK, <https://github.com/UOL-COLS/ProcessingPAL>), a freely available java application that uses a validated algorithm to identify valid waking wear time (221). It produces summary data based on the identified valid waking wear data. The default algorithm thresholds within the application were used. Data were included in the final analysis if accelerometers were worn for a minimum of one valid workday and one valid non-workday. As required for previous accelerometer studies, a valid day required a minimum of 600 minutes of wear-time whilst awake (131). Participants had to work at least one clinical session for it to be considered a valid workday. Accelerometer data were used to determine sedentary time, standing time and step-counts.

Questionnaire data were reviewed to ensure there were no duplicates, with IBM SPSS Statistics (version 29.0) used for statistical analyses. 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 χ^2 where appropriate, with multiple linear regression and binary logistic regression analyses to explore the relationship between key predictors (age, sex, body mass index (BMI), active workstation use, workday and non-workday sedentary time, workday and non-workday step-count) with burnout and fatigue. Free-text answers to open questions were categorised into positive (participants reporting that working in general practice had favourable effects on their health and wellbeing), neutral (participants reporting that working in general practice had no real effect on their health and wellbeing), or negative (participants reporting that working in general practice had detrimental effects on their health and wellbeing) responses. Feasibility outcomes were: to assess the ratio of participants recruited to the accelerometer study from the initial questionnaire; to assess the number of accelerometers from which data was

successfully gathered; to assess the relationship between GP movement behaviours with their levels of burnout and fatigue.

Based on accelerometer and questionnaire data, a power calculation was subsequently undertaken to estimate the sample size required to detect a reduction in burnout from 30% to 10% through an intervention study, in the form of a randomised controlled trial, investigating the effect of introducing active workstations among GPs.

6.3 Results

Recruitment:

At the end of the initial questionnaire, 195 participants (55.2%) had indicated they were willing to be invited to take part in a subsequent accelerometer study to gain objective data regarding their sedentary behaviour and physical activity behaviours. Of these, 160 were approached by email for this study, as 35 had previously been approached for a different accelerometer study and had either participated in or been ineligible. Seventy-five (46.9%) participants replied to the recruitment email for this study. Eight did not meet the inclusion criteria: five were on maternity leave; two were on annual leave; and one was not currently working in general practice. Two stated they could not participate due to excessive workload, and one did not give a reason for declining participation when contacted. Three initially expressed an interest in participating, but later withdrew before the study commenced without providing a reason. Sixty-one participants from the 160 initially approached (38.1%) met the inclusion criteria for this study and were successfully enrolled.

Data capture and analysis:

Of the 61 participants posted an accelerometer, valid accelerometer data were obtained from 47 (77.0%) participants. Data from 14 participants could not be analysed due to accelerometers getting lost or malfunctioning. Of the participants with valid accelerometer data, 46 (97.9%) completed all questions on the online questionnaire.

Sample characteristics:

Summary characteristics of participants for whom valid accelerometer data were obtained are included in Table 7. Four participants (8.7%) used an active workstation, such as a sit-stand desk. Average age of participants was 41.4 years (Standard Deviation (SD) 8.3), average BMI was 25.0 kg/m² (SD 4.5), average alcohol intake was 6.8 units per week (SD 7.0) and no participants smoked tobacco. The characteristics of males and females were generally balanced.

Table 7. Participant characteristics and baseline data

Characteristic	All participants	Female	Male	Significance
Sex, female/male, n (%)	24 (51.1) / 23 (49.9)			
Age, years, mean (SD)	41.4 (SD 8.3)	41.7 (9.0)	41.1 (7.6)	MD 0.6, 95% CI = -5.9 to 4.6, P = 0.315
BMI, kg/m ² (SD)	25.0 (4.5)	24.3 (5.1)	25.7 (3.6)	MD 1.4, 95% CI = -1.3 to 4.1, P = 0.152
Alcohol, units per week (SD)	6.8 (7.0)	4.6 (5.1)	9.2 (7.9)	MD 4.6, 95% CI = -0.6 to 8.6, P = 0.141

Use of active workstation, no/yes, n (%)	4 (8.7) / 42 (91.3)	1 (4.2) / 23 (95.8)	3 (13.6) / 19 (86.4)	χ^2 (1, n = 46) = 0.378, P = 0.539
Workday sedentary time, hours (SD)	10.6 (1.5)	10.9 (1.2)	10.3 (1.8)	MD 0.6, 95% CI = -1.5 to 0.3, P = 0.288
Non-workday sedentary time, hours (SD)	8.0 (1.6)	8.4 (1.3)	7.7 (1.7)	MD 0.7, 95% CI = -0.5 to 0.2, P = 0.432
Working day standing time, hours (SD)	3.8 (1.3)	3.6 (0.9)	4.0 (1.5)	MD 0.4, 95% CI = -0.4 to 1.2, P = 0.128
Non-workday standing time, hours (SD)	4.7 (1.4)	4.5 (1.2)	4.9 (1.6)	MD 0.4, 95% CI = -0.4 to 1.2, P = 0.600
Average workday step-count (SD)	3897.7 (1541.5)	3702.0 (1620.7)	4102.0 (1426.0)	MD 400.0, 95% CI = - 518.0 to

				1318.2, P = 0.999
Average non-workday step-count (SD)	6204.0 (2224.3)	5894.0 (1562.6)	6527.5 (2712.4)	MD 633.5, 95% CI = - 688.9 to 1955.8, P = 0.006

*SD = standard deviation, MD = mean difference

Sedentary time, standing time and step-counts:

Multiple linear regression exploring the relationship between sedentary time, standing time and step-counts with age, sex, burnout, active workstation use and BMI is shown in Table 8. Average workday sedentary time was 10.6 hours (SD 1.5). There was a 4.2 hour (95% CI 2.8 to 5.7, $p < 0.001$) decrease in workday sedentary time for active workstation users compared to non-users, accounting for age, sex, burnout and BMI. Average non-workday sedentary time was 8.0 hours (SD 1.6), with no significant difference between active workstation users compared to non-users, accounting for age, sex, burnout and BMI (MD 1.1 hours, 95% CI -3.2 to 1.0, $p = 0.303$). Average workday standing time was 3.8 hours (SD 1.3). There was a 3.8 hour (95% CI 2.6 to 5.1, $p < 0.001$) increase in workday standing time for active workstation users compared to non-users, accounting for age, sex, burnout and BMI. Average non-workday standing time was 4.7 hours (SD 1.4), with no significant difference between active workstation users compared to non-users, accounting for age, sex, burnout and BMI (MD 57.1 minutes, 95% CI -57.2 minutes to 2.9 hours, $p = 0.318$). Average workday step-count was 3897.7 steps (SD 1541.5) and average non-workday step-count was 6204.0 steps (SD 2224.3) (MD 2306.3, 95% CI 1693.8 to 2919.7, $p < 0.001$). There was no significant difference between any of the selected predictors (age, sex, BMI, active workstation use and burnout) and step-count ($p > 0.1$).

Table 8. Multiple linear regression exploring the relationship between sedentary time, standing time and step-counts with age, sex, burnout, active workstation use and BMI

	β	SE	t-value	p
Workday sedentary time (minutes)				
Age (per additional year)	2.321	1.262	51.838	0.074
Sex (for females vs males)	5.849	21.689	0.270	0.789
Burnout (per unit increase)	5.004	10.197	0.491	0.627
Use of active workstation (for users vs non-users)	-254.385	42.080	-6.045	<0.001
BMI (per unit increase (kg/m ²))	1.101	2.345	0.468	0.643
Non-workday sedentary time (minutes)				
Age (per additional year)	0.840	1.848	0.454	0.652
Sex (for females vs males)	-29.780	31.753	-0.938	0.355

Burnout (per unit increase)	9.850	14.928	0.660	0.514
Use of active workstation (for users vs non-users)	-64.353	61.605	-1.045	0.303
BMI (per unit increase (kg/m ²))	4.748	3.447	1.377	0.177
Workday standing time (minutes)				
Age (per additional year)	0.373	1.138	0.328	0.745
Sex (for females vs males)	-1.107	19.554	-0.057	0.955
Burnout (per unit increase)	7.238	9.193	0.787	0.436
Use of active workstation (for users vs non-users)	230.413	37.937	6.074	<0.001
BMI (per unit increase (kg/m ²))	0.594	2.123	0.280	0.781
Non-workday standing time (minutes)				

Age (per additional year)	-0.710	1.692	-0.420	0.677
Sex (for females vs males)	-19.114	29.062	0.658	0.515
Burnout (per unit increase)	-0.180	13.663	-0.013	0.990
Use of active workstation (for users vs non-users)	57.141	56.384	1.013	0.318
BMI (per unit increase (kg/m ²))	-3.668	3.155	-1.163	0.253
Workday step-count (steps)				
Age (per additional year)	-4.965	30.436	-0.163	0.871
Sex (for females vs males)	-246.404	522.915	0.471	0.640
Burnout (per unit increase)	-329.835	245.836	-1.342	0.188

Use of active workstation (for users vs non-users)	451.727	1014.527	0.445	0.659
BMI (per unit increase (kg/m ²))	22.205	56.781	0.391	0.698
Non-workday step-count (steps)				
Age (per additional year)	-2.215	44.078	-0.050	0.960
Sex (for females vs males)	-536.545	757.289	0.709	0.483
Burnout (per unit increase)	-461.549	356.021	-1.296	0.203
Use of active workstation (for users vs non-users)	341.268	1469.245	0.232	0.818
BMI (per unit increase (kg/m ²))	-55.511	82.202	-0.675	0.504

Burnout:

Burnout was reported by 14 (30.4%) of the participants for whom valid accelerometer data was available. Multiple linear regression was used to determine if there was a relationship between burnout, sedentary time and step-counts. There was a non-significant 5.0 minute (95% CI -15.7

to 25.7, $p=0.627$) increase in workday sedentary time for each unit increase in burnout, accounting for age, sex, use of active workstation and BMI. There was a non-significant 9.9 minute (95% CI -20.4 to 40.1, $p=0.514$) increase in non-workday sedentary time for each unit increase in burnout, accounting for age, sex, use of active workstation and BMI. There was a non-significant 329.8 step (95% CI -828.4 to 168.7, $p=0.188$) decrease in workday step-count for each unit increase in burnout, accounting for age, sex, use of active workstation and BMI. There was a non-significant 461.5 step (95% CI -1183.6 to 260.5, $p=0.203$) decrease in non-workday step-count for each unit increase in burnout, accounting for age, sex, use of active workstation and BMI.

Fatigue:

Severe fatigue was reported by 16 (34.8%) of the participants for whom valid accelerometer data was available. Eleven of the 16 participants (68.8%) reporting severe fatigue also reported burnout, showing a significant overlap between burnout and severe fatigue ($\chi^2 (1, n = 46) = 17.011, p<0.001$). Binary logistic regression, shown in Table 9, revealed no significant relationship between BMI, workday sedentary time, non-workday sedentary time, workday standing time, workday step-count and non-workday step-count with severe fatigue ($p>0.1$).

Table 9. Binary logistic regression exploring relationship between fatigue with age, BMI, sedentary time, standing time and step-counts

	β	SE	Wald	p	OR (95% CI)
Age	0.014	0.052	0.072	0.789	1.014 (0.917-1.122)
BMI	0.143	0.106	1.827	0.176	1.154 (0.938-1.420)

Workday sedentary time	-0.007	0.010	0.444	0.505	0.993 (0.974- 1.013)
Non-workday sedentary time	-0.008	0.007	1.019	0.313	0.992 (0.978- 1.007)
Workday standing time	-0.013	0.011	1.386	0.239	0.987 (0.967- 1.008)
Non-workday standing time	0.010	0.009	1.428	0.232	1.011 (0.993- 1.028)
Workday step-count	-0.001	0.000	2.556	0.110	0.999 (0.999- 1.000)
Non-workday step-count	0.000	0.000	2.171	0.141	1.000 (0.999- 1.000)

Power calculation:

Given there was a significant reduction in workday sedentary time among users of active workstations, and a non-significant increase in workday sedentary time for each unit increase in burnout, there could potentially be a benefit among GPs whereby using active workstations may help to reduce their levels of burnout. A power calculation was therefore undertaken to estimate the sample size required to detect a reduction in burnout from 30% to 10% through an intervention study, in the form of a randomised controlled trial, investigating the effect of introducing active workstations among GPs with the aim of reducing both their sedentary time

and their levels of burnout. If 92 participants were recruited to the intervention group, and 92 to the control group, the study would have 90% power to detect, as significant at the 5% level, a reduction in the proportion with burnout of 20% in the intervention group compared with the control group, from 30% to 10%. For practical application in future research, this power calculation must be interpreted with caution as higher numbers of participants would need to be recruited to account for participant dropout and accelerometer loss/malfunction. It would also be important to control for the workload of each participant, which is likely more impactful than their movement behaviours on their levels of burnout.

Free-text responses:

In response to the question “How do you feel about your overall levels of physical activity and sedentary behaviour?”, 23 (50%) responses were negative, 10 (21.7%) were neutral, and 13 (28.3%) were positive. An example of a negative response was *“I am ashamed by how sedentary my life is. After a day working as a GP sitting down all day I have very little energy or mental power to do anything else. I have a gym membership which I keep paying for but haven't used in over 2 years.”* An example of a neutral response was *“Outside work - lots of physical activity, inside - very sedentary.”* An example of a positive response was *“Due to the pandemic I started being more active as a way of dealing with stress. The sedentary nature of our work has been on my mind for a while and the pandemic gave me the impetus to start moving.”*

When asked “How do you feel about the amount of time you spend sitting down in work?”, 42 (91.3%) responses were negative, 2 (4.3%) were neutral, and 2 (4.3%) were positive. The two positive responses were from participants with active workstations. An example of a negative response was *“I hate the amount of time I sit at my desk and some days can easily sit there the entire day.”* An example of a neutral response was, *“It's not bad, as I tend to take walks often, but I'd prefer to move more often.”* An example of a positive response was, *“I have significantly reduced this since I got my standing desk.”*

In response to the question “How does working in general practice affect your health and wellbeing?”, 32 (69.6%) responses were negative, 11 (23.9%) were neutral and 3 (6.5%) were positive. An example of a negative response was, *“It's not healthy- long hours sitting without*

breaks, constant pressure to get through the work and do so safely. Never finishing work at the end of the day and having admin work constantly hanging over and playing on my mind. I manage, but these things make it unhealthy.” An example of a neutral response was, *“Sometimes I feel tired and stressed but I also have a fulfilling career where I feel I can make a difference.”* An example of a positive response was, *“I don’t feel it makes a big difference compared to other specialities, although working part time with weekends free allow me to pursue hobbies and time with family. I enjoy work so it is generally a positive experience.”*

6.4 Discussion

6.4.1 Summary

These findings indicate that it is feasible to gain objective measurements of sedentary behaviour and physical activity among GPs using accelerometers, along with self-reported assessment of burnout and fatigue.

Average workday sedentary time of 10.6 hours (SD 1.5) was much higher than the recommended 24-hour movement guidelines for adults, which advise limiting sedentary time to eight hours or less per day (142, 222). However, average non-workday sedentary time of 8.0 hours (SD 1.6) per day was in line with these recommendations (142, 222). Sedentary time among participants in this study was similar to the previous study exploring sedentary behaviour and physical activity among GPs, described in Chapter 3 (220). The significant 2306.3 steps per day increase in average step-count on non-workdays (6204.0 steps (SD 2224.3)) compared to workdays (3897.7 steps (SD 1541.5)) shows that GPs primarily replace sedentary behaviour with physical activity on non-workdays compared to workdays and achieve non-workday step-counts closer to the 8,000 steps daily target for healthy adults (223). This was supported by free text responses where participants reported purposefully undertaking more physical activity on non-workdays, due to feeling unsatisfied with their high levels of sedentary behaviour and low levels of physical activity on workdays.

6.4.2 Comparison with existing literature

There was a high level of burnout, which affected 30.4% of participants. This is within the upper range of the 6-33% prevalence estimate of burnout among GPs in a recent systematic review and meta-analysis of 22,177 GPs across 29 countries (203). The reason for the high level of burnout is likely related to pressures of the job, with many free-text responses outlining high workload, long hours, and physical and mental health concerns related to working in general practice. Although there was no statistically significant relationship between burnout with sedentary time and step-counts, there was a weak association whereby higher levels of burnout were associated with higher sedentary time and lower step-counts on both workdays and non-workdays. This could be examined in more depth in the form of a suitably powered study exploring whether interventions, such as introducing active workstations, can be effective in reducing sedentary time and increasing step-counts among GPs, and if so, whether this can help to reduce burnout. A power calculation demonstrated that if 184 participants were recruited to a randomised controlled trial, where half the participants received active workstations (intervention group), and half remained under usual conditions (control group), the study would have 90% power to detect, as significant at the 5% level, a reduction in the proportion with burnout of 20% in the intervention group compared with the control group.

There was a high prevalence of severe fatigue, affecting 34.8% of participants. This is similar to previous studies examining fatigue among nurses and prehospital emergency care providers (220, 221). There is a lack of previous research examining fatigue among GPs, likely because fatigue has a more general definition than burnout, which is more specifically work related.

There was a high degree of overlap between severe fatigue and burnout, with 68.8% of participants reporting both severe fatigue and burnout. Previous research has shown that individuals with concurrent severe fatigue and burnout are more likely to have worse health and work related outcomes than individuals reporting only one of these conditions (222).

Free text responses showed that most GPs felt negatively about their overall levels of sedentary behaviour and physical activity (50%), work-related sedentary behaviour (91.3%) and how working in general practice affected their health and wellbeing (69.6%). This is in keeping with

previous research examining GPs' opinions regarding sedentary behaviour and physical activity (192, 223) and is likely a contributing factor to their high levels of burnout and fatigue.

However, it is also important to note that many free-text responses described job related stresses and high workload as contributing to burnout and fatigue, which are difficult to address in the current climate of high workload.

6.4.3 Strengths and limitations

Strengths of this study include that demographic data of participants were similar to publicly available data regarding GPs in Northern Ireland (224) and accelerometer-measured movement behaviours are more accurate than self-reported measures (131). This study has some limitations that need to be considered. Selection bias may have occurred, whereby participants were more interested in sedentary behaviour and physical activity than non-participants. Non-participants may not have had time to respond to the initial questionnaire, which means they may have had higher levels of burnout and fatigue than participants.

6.4.4 Conclusion

Despite there being widespread awareness of the harms of burnout and fatigue on health outcomes among clinicians and patients alike, levels of burnout and fatigue remain high among GPs. The reasons for this are multifactorial, with job related stresses and high workload likely key factors. Given that primary care workload is unlikely to reduce in the foreseeable future, it is important to consider other factors relating to burnout and fatigue. This study found that increased sedentary behaviour and reduced physical activity had a weak association with increased burnout among GPs and thus GPs should consider how they can reduce their sedentary behaviour and increase their physical activity on workdays to help optimise their wellbeing at work. In future, a suitably powered intervention study aiming to reduce sedentary behaviour and increase physical activity among GPs may be able to detect whether this has a significant effect on reducing their levels of burnout and fatigue.

Chapter 7 – Overall Summary and Discussion

7.1 Summary of the main findings

This thesis has achieved the aims outlined in Chapter 1:

- To systematically examine and synthesise previous research regarding levels of sedentary behaviour among GPs;
- To obtain quantitative data regarding current levels of sedentary behaviour among GPs;
- To gain qualitative data regarding the barriers and facilitators to GPs improving their movement behaviours;
- To explore the feasibility of undertaking an intervention study aiming to reduce burnout by reducing sedentary behaviour and increasing physical activity among GPs.

On completion of the narrative literature review (in Chapter 2) and systematic literature review (in Chapter 3), there was a paucity of research identified which examined current levels of sedentary behaviour among GPs. Instead, there was a much larger volume of research examining sedentary behaviour among other specific population groups such as office workers and older adults. In the systematic review, just two papers were identified which assessed levels of sedentary behaviour among GPs, both of which used self-reported estimations (9, 10). Given that it has been established that GPs who are more physically active are more likely to recommend physical activity to their patients, and patients are more likely to make healthy lifestyle changes if they believe their doctor follows the health advice themselves (86-89), there was therefore a clear need for more reliable and objective data to determine the current levels of sedentary behaviour among GPs, particularly in light of the increase in remote consulting as a result of the COVID-19 pandemic.

Findings from the questionnaire and accelerometer study of sedentary behaviour among GPs (in Chapter 4) demonstrated that most GPs (those without active workstations, comprising 94.4% of the sample) are sedentary for around 10.5 hours between waking up and going to sleep on each workday, compared to around eight hours on each non-workday. Their workday

sedentary time was much higher than the minority of GPs (5.6%) who had access to active workstations, such as height adjustable sit-stand desks, who averaged around eight hours of workday sedentary time. Among GPs with active workstations, this reduction in workday sedentary time was almost fully replaced by static standing time. There was no significant difference in non-workday sedentary time between participants that had active workstations and those that did not. Interestingly, participants working in general practice with active workstations had similar levels of workday sedentary time to GPSTs working in secondary care settings.

Semi-structured interviews were subsequently undertaken with accelerometer study participants (in Chapter 5), where participants were given feedback regarding their movement behaviours on workdays and non-workdays. Despite there being widespread awareness among GPs of the health risks associated with physical inactivity, and of the current UK physical activity guidelines, they identified many barriers that hindered their abilities to reduce their sedentary behaviour and increase their physical activity. These included workload, personal and professional roles and responsibilities, and physical infrastructure. Several factors were seen as being enablers for some, and barriers for others. These included telemedicine, the local environment, social influences, patient and public perceptions, and climate and seasonality. GPs did recognise their potential to be positive role models in encouraging patients and colleagues to become more physically active. They were aware that for this advice to seem credible to patients, GPs should aim to be less sedentary and more physically active themselves. However, despite the potential for GPs to be positive role models for physical activity, there were concerns about negative public perceptions if GPs were seen to be taking breaks for physical activity during the working day, especially due to ongoing concerns around patient access and primary care workload. It therefore appeared that many GPs did not feel able to adopt the role of being a positive physical activity role model to their patients, which represents a missed opportunity for healthy lifestyle promotion and the associated benefits this could entail.

Many participants in the semi-structured interviews reported feelings of burnout and fatigue. Given that burnout and fatigue can be reduced by increasing physical activity, an exploratory accelerometer-measured feasibility study was conducted (in Chapter 6), which examined the relationship between GP movement behaviours with burnout and fatigue. This involved gathering more accelerometer data examining movement behaviours among GPs, as well as questionnaire data regarding their subjective levels of burnout and fatigue. Burnout and severe fatigue were each reported by one third of participants. There was a significant amount of overlap between the two, as 68.8% of participants who reported severe fatigue also reported burnout. There was a significant reduction in workday sedentary time among users of active workstations, and a non-significant increase in workday sedentary time for each unit increase in burnout. A power calculation was therefore undertaken to estimate the sample size required to detect a reduction in burnout from 30% to 10% through an intervention study, in the form of a randomised controlled trial, investigating the effect of introducing active workstations among GPs. If 92 participants were recruited to the intervention group, and 92 to the control group, the study would have 90% power to detect, as significant at the 5% level, a reduction in the proportion with burnout of 20% in the intervention group compared with the control group, from 30% to 10%. With levels of burnout and fatigue remaining high among GPs, and primary care workload unlikely to reduce in the foreseeable future, a suitably powered intervention study aiming to reduce sedentary behaviour and increase physical activity among GPs may be able to detect whether this has a significant effect on reducing their levels of burnout and fatigue.

7.2 Implications for practice and future research

Although it appears that levels of sedentary behaviour among GPs were high prior to the COVID-19 pandemic, workday sedentary time among the majority of GPs has increased since the onset of the pandemic due to the increased use of telemedicine. Previous opportunities to break up sedentary time have been reduced, such as getting up to wash hands or greet patients. It is therefore important to consider ways of reducing workday sedentary time among

GPs, given their high levels of burnout, the negative health effects of excessive sedentariness, and the role of GPs in counselling patients about healthy lifestyle choices. The Royal College of General Practitioners (RCGP) has promoted some initiatives aimed at encouraging physical activity, such as “parkrun practices”, and the “Active Practice Charter,” however there has been little research to evaluate their effectiveness. One potential approach to reduce sedentary behaviour is the use of active workstations, which are already being used by a minority of GPs. However, although users of active workstations had significantly less workday sedentary time than non-users, their sedentary time was primarily replaced by static standing time. Multi-component interventions, using a variety of methods aimed at reducing workday sedentary behaviour and increasing workday physical activity, may be more successful than single-component interventions such as standing desks. In future, research could assess whether levels of sedentary time and physical activity among GPs changes with the easing of restrictions related to the COVID-19 pandemic and the adoption of new technologies. It will also be relevant to consider sedentary behaviour and physical activity among other members of the primary care multidisciplinary team, such as administrative staff and allied health professionals. Furthermore, it will be imperative to explore the thoughts of patients and the wider primary care multidisciplinary team on these themes. Now that baseline data has been gathered regarding GP sedentary behaviour and physical activity, an adequately powered study could be performed to assess the efficacy of an intervention study to improve GP movement behaviours.

7.3 Personal reflections

I am very fortunate to have had the opportunity to undertake this research as part of the General Practice Academic Research Training Scheme at Queen’s University Belfast, with funding from the Northern Ireland Medical and Dental Training Agency and the Health and Social Care Research and Development Division. I have especially enjoyed the interaction with my research colleagues, although unfortunately face-to-face interaction was reduced during lockdown restrictions in the midst of the COVID-19 pandemic. I have been particularly lucky to

have had such enthusiastic and hard-working supervisors, as well as the opportunity to collaborate with skilled and knowledgeable researchers from other institutions.

Initially I had planned to undertake a feasibility study introducing height-adjustable sit-stand desks into the general practice setting, however it was important to take a step back and first assess the current levels of sedentary behaviour among GPs and GPSTs. The study design had to be modified extensively in light of the COVID-19 pandemic. Original ethical approval for a study involving in-person recruitment was granted on 7th April 2020, by which time the first COVID-19 lockdown was in place and I was working in full-time clinical practice for seven weeks! When I returned to my research work, we realised we had to redesign the study for remote recruitment instead. This was helped by having an approachable and understanding ethics department who were able to guide me through the amendment process. It also demonstrates the challenges and opportunities brought about by the COVID-19 pandemic. Although I initially worried that I would struggle to complete any meaningful research, I soon realised that the new ways of working in light of COVID-19 only served to increase the importance of considering sedentary behaviour and physical activity, as well as opening up more opportunities for collaboration. I was fortunate to collaborate with world-renowned researchers from Ulster University, the University of Southern Denmark, Loughborough University and the University of Leicester.

Personally, I love to be physically active as much as possible. This is helped by living in a part of the world (County Down) where mountains, beaches and forests are all within a short distance of my home, and my ability to use a sit-stand desk for both my research and clinical work. I have been able to see how reducing my sedentary behaviour and increasing my physical activity has benefitted my own health, wellbeing and productivity. Over the past year I have been interested to observe how my young son, Henry, and other children of his age never sit still, and are constantly on the move. I feel that that this is something that we should seek to encourage through the life course, instead of forcing people into the sedentary status quo predominant throughout much of modern society. I have therefore been pleased to see the

popularity of recent initiatives such as the daily mile, parkrun, and walking football as ways of increasing physical activity for people of all ages.

I have thoroughly enjoyed sharing my research findings and helping others to consider their own sedentary behaviour and physical activity through a variety of methods. This has included formal scientific writing through journal publications, and informal writing through a blog at themovingmedic.net, social media and a guest blog in the Northern Ireland Faculty RCGP weekly update. In writing this thesis, I have based the structure around the journal papers which I have been fortunate to see published. While trying to keep my writing concise, I have noticed a difference between adhering to the stringent word count requirements of most medical journals, compared with the more generous word count available for this academic thesis. I have therefore enjoyed this opportunity to go into more depth than I had previously been able to during the project.

As most scientific conferences were held virtually due to the COVID-19 pandemic, this allowed me to attend and present my research at many more conferences than would previously have been possible. I have been pleasantly surprised by the interest and debate that my work has stimulated, both inside and outside the field of general practice.

In carrying out this work, I have learned how I relish trying to have a positive impact on people's health and wellbeing by helping them to improve their lifestyle choices. Working in general practice is one way of doing this on an individual, person-to-person level. However, conducting this research project allowed me to promote healthy lifestyle choices on a much wider level than is possible in day-to-day clinical practice. I have been delighted to see more and more GPs using active workstations and taking action to improve their movement behaviours, which I have hopefully played a small part in. Following completion of this project I have started to develop a technology-based intervention to encourage people to optimize their use of sit-stand desks. Although many people now own sit-stand desks, lots of people end up sitting behind them almost constantly, in which case they don't get any benefit. Another problem is that many people end up standing behind them for too long, which can also be detrimental to their health. I am now hoping to develop an intervention to encourage sit-stand desk-users to optimize the

amount of time they spend sitting and standing each day, so they can live longer, happier and healthier lives. I entered the NHS Clinical Entrepreneur Programme with this idea in 2022, as part of the first cohort from Northern Ireland to participate. I now hope to develop the concept into a viable business while also working as a portfolio GP.

Appendix 1 – Newcastle-Ottawa Quality Assessment Scale (adapted for cross-sectional studies)

Selection: (Maximum 5 stars)

1) Representativeness of the sample:

- a) Truly representative of the average in the target population. * (all subjects or random sampling)
- b) Somewhat representative of the average in the target population. * (nonrandom sampling)
- c) Selected group of users.
- d) No description of the sampling strategy.

2) Sample size:

- a) Justified and satisfactory. *

b) Not justified.

3) Non-respondents:

a) Comparability between respondents and non-respondents characteristics is established, and the response rate is satisfactory. *

b) The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory.

c) No description of the response rate or the characteristics of the responders and the non-responders.

4) Ascertainment of the exposure (risk factor):

a) Validated measurement tool. **

b) Non-validated measurement tool, but the tool is available or described. *

c) No description of the measurement tool.

Comparability: (Maximum 2 stars)

1) The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled.

a) The study controls for the most important factor (select one). *

b) The study controls for any additional factor. *

Outcome: (Maximum 3 stars)

1) Assessment of the outcome:

- a) Accelerometry-measured objective data. **
- b) Self report. *
- c) No description.

2) Statistical test:

- a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). *
- b) The statistical test is not appropriate, not described or incomplete.

Scoring:

Very Good Studies: 9-10 points

Good Studies: 7-8 points

Satisfactory Studies: 5-6 points

Unsatisfactory Studies: 0 to 4 points

This scale has been adapted from the Newcastle-Ottawa Quality Assessment Scale for cohort studies to perform a quality assessment of cross-sectional studies for the systematic review, "Sedentary Behaviour Among General Practitioners: A Systematic Review."

Appendix 2 – Sedentary behaviour questionnaire

Online Questionnaire

Section 1: Background Information

1.Age

- Enter your answer

2.Gender

- Female
- Male
- Prefer not to say

3.Current job role

- GP
- GPST1
- GPST2
- GPST3

4.Current working environment(s)

- GP
- Paediatrics
- Emergency Medicine
- General Medicine
- Obstetrics and Gynaecology
- Psychiatry
- Other

5.Name of GP surgery where you are primarily based

Enter your answer

6.Number of clinical sessions per week in General Practice (on average)

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7

- 8
- 9
- 10

7.Number of non-clinical sessions per week in General Practice (on average)

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

8.Number of sessions per week in roles outside of General Practice (on average)

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

9.Are you full time or less than full time?

- Full time
- Less than full time

10.What is your percentage of full-time equivalent?

Enter your answer

11.Current clinical working environment(s)

- General Practice
- Paediatrics
- Emergency Medicine

- General Medicine
- Obstetrics and Gynaecology
- Psychiatry
- Other

12. Name of GP surgery where you are primarily based

Enter your answer

Section 2: Sedentary Behaviour Questions for GPs and GPSTs in General Practice

The following questions are about activities you did over the past week while sitting, reclining or lying down. Do not count the time you spent sleeping or napping. Only count the time when this was your main activity. For example if you were watching television and surfing the internet, count it as television time or computer time, but not as both.

13. On a typical day when you worked in General Practice in the past week, how much time did you spend sitting or lying down and...

Watching TV or using a computer, tablet or smartphone? Count time watching videos, playing computer games, emailing or using the Internet inside and outside of work.

Please answer in hours and minutes. This includes the full day inside and outside of work.

Enter your answer

14. On a typical day when you worked in General Practice in the past week, how much time did you spend sitting or lying down and...

Reading a book or magazine? Only include reading during free time. Include reading done using electronic formats. Do not include time spent reading at work, during class time or while exercising.

Please answer in hours and minutes. This includes the full day inside and outside of work.

Enter your answer

15. On a typical day when you worked in General Practice in the past week, how much time did you spend sitting in a car, bus or train?

Please answer in hours and minutes. This includes the full day inside and outside of work.

Enter your answer

16. During the last 7 days, on a typical day when you worked in General Practice, how much OVERALL time did you usually spend sitting, reclining or lying down ? (Include time spent at work, at home, while doing course work, and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, watching television).

Please answer in hours and minutes.

Enter your answer

17. On a typical DAY OFF WORK in the past week, how much time did you spend sitting or lying down and...

Watching TV or using a computer, tablet or smartphone? Count time watching videos, playing computer games, emailing or using the Internet.

Please answer in hours and minutes.

Enter your answer

18. On a typical DAY OFF WORK in the past week, how much time did you spend sitting or lying down and...

Reading a book or magazine? Include reading done using electronic formats. Do not include time spent reading during class time or while exercising.

Please answer in hours and minutes.

Enter your answer

19. On a typical DAY OFF WORK in the past week, how much time did you spend sitting in a car, bus or train?

Please answer in hours and minutes.

Enter your answer

20. During the last 7 days, on a typical DAY OFF WORK, how much OVERALL time did you usually spend sitting, reclining or lying down? Include time spent at home, while doing course work, and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, watching television.

Please answer in hours and minutes.

Enter your answer

21. In work, would you prefer more or less time sitting down, or are you happy with things the way they are?

More time sitting

Same amount of time sitting as now

Less time sitting

22. In your General Practice working environment, do you have access to an "active workstation" such as a standing desk?

Yes

No

23. Would you ever consider using an "active workstation" (such as a standing desk) in work?

Yes

No

Maybe

24. When working as a GP in the current environment, do you feel that you now spend more time sitting, or less time sitting than prior to the COVID-19 pandemic?

More time sitting

Same amount of time sitting as before

Less time sitting

25. Why do you feel that you are spending more time sitting now than prior to the COVID-19 pandemic?

Enter your answer

26. Why do you feel that you are spending less time sitting now than prior to the COVID-19 pandemic?

Enter your answer

Section 3: Sedentary Behaviour Questions for GPSTs Working in Secondary Care

27. On a typical WORKING DAY in the past week, how much time did you spend sitting or lying down and...

Watching TV or using a computer, tablet or smartphone? Count time watching videos, playing computer games, emailing or using the Internet inside and outside of work.

Please answer in hours and minutes. This includes the full day inside and outside of work.

Enter your answer

28. On a typical WORKING DAY in the past week, how much time did you spend sitting or lying down and...

Reading a book or magazine? Only include reading during free time. Include reading done using electronic formats. Do not include time spent reading at work, during class time or while exercising.

Please answer in hours and minutes. This includes the full day inside and outside of work.

Enter your answer

29. On a typical WORKING DAY in the past week, how much time did you spend sitting in a car, bus or train?

Please answer in hours and minutes. This includes the full day inside and outside of work.

Enter your answer

30. During the last 7 days, on a typical WORKING DAY, how much OVERALL time did you usually spend sitting, reclining or lying down? (Include time spent at work, at home, while doing course work, and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, watching television).

Please answer in hours and minutes.

Enter your answer

31. On a typical DAY OFF WORK in the past week, how much time did you spend sitting or lying down and...

Watching TV or using a computer, tablet or smartphone? Count time watching videos, playing computer games, emailing or using the Internet.

Please answer in hours and minutes.

Enter your answer

32. On a typical DAY OFF WORK in the past week, how much time did you spend sitting or lying down and...

Reading a book or magazine? Include reading done using electronic formats. Do not include time spent reading during class time or while exercising.

Please answer in hours and minutes.

Enter your answer

33. On a typical DAY OFF WORK in the past week, how much time did you spend sitting in a car, bus or train?

Please answer in hours and minutes.

Enter your answer

34. During the last 7 days, on a typical DAY OFF WORK, how much OVERALL time did you usually spend sitting, reclining or lying down? Include time spent at home, while doing course work, and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, watching television.

Please answer in hours and minutes.

Enter your answer

35. In work, would you prefer more or less time sitting down, or are you happy with things the way they are?

More time sitting

Same amount of time sitting as now

Less time sitting

36. Thank you for taking the time to participate in this survey. Have you any other comments relating to this study?

Enter your answer

Section 4: Accelerometer Study

Thank you for taking the time to participate in this survey. A small number of participants in this survey will be approached to find out if they are interested in participating in a further study, which will involve wearing an accelerometer (a non-invasive device which can monitor levels of physical activity and sedentary behaviour) for a period of up to one week. If you are agreeable to being contacted for the purpose of this follow-up accelerometer study, please enter your details in the boxes below. Your details will be seen only by the research team and will be deleted after the study is complete.

If you are not interested in participating in the accelerometer study, do not enter your details and simply state if you have any further comments relating to this survey.

37. Please enter your full name

Enter your answer

38. Please enter your email address

Enter your answer

39. Please enter your telephone number

Enter your answer

40. Thank you for taking the time to participate in this survey. Have you any other comments relating to this study?

Enter your answer

ID Number:



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Appendix 3 – Accelerometer study instructions and sleep/work log

Thigh-Worn Accelerometer Instructions

How do I wear the accelerometer?

- Please start wearing the accelerometer as soon as you can, preferably beginning on the day you receive the accelerometer in the post.
- The accelerometer is attached directly onto the skin and positioned on the front of the right thigh, between hip and knee, with the arrow pointing down towards the knee.
- Simply peel off the backing on the rear of the accelerometer to stick it to the skin of your right thigh. Then apply the Tegaderm waterproof dressing over the top. It may be preferable to shave this area beforehand if necessary. You may also want to refer to the videos sent with the consent form email for clear instructions.
- Please wear the accelerometer **every day for 7 days**.
- Please wear the accelerometer **continuously** (24 hours/day).
- The accelerometer can be worn during sleep and is water resistant (to 1m) so you can wear it whilst showering and bathing.
- The waterproof adhesive patch that sticks the accelerometer to your skin should last for the duration of the study.
- If for any reason you need to reapply the accelerometer and dressing then please use the enclosed additional tape and dressing.



How do I change the adhesive patch?

- First, remove the waterproof dressing covering the accelerometer on your thigh (note that this may cause some slight discomfort). Then, peel the adhesive patch off the accelerometer.
- With an alcohol prep pad provided in your pack, thoroughly wipe down the monitor and the area of your leg where the accelerometer was attached.
- Stick one side of the double-sided sticky tape to the back of the accelerometer. Then peel off the backing of the double-sided sticky tape, before pressing the back of the accelerometer onto your skin. Position the accelerometer in the same spot as previously on your thigh (or on the other thigh if you have had a slight irritation), ensuring that the arrow is pointing down towards the knee.
- Then apply the Tegaderm waterproof dressing over the top, as you did at the start of the study.
- If you experience any issues while wearing the accelerometer, please email or call Richard Mayne (rmayne02@qub.ac.uk, telephone number).

What else do I need to do?

ID Number:



- It is important that you fill in the **Daily Log** on the following pages every day for the 7 days while you are wearing the accelerometer.
- This helps us to look specifically at the data from when you were awake and when you were in work.

Returning your Accelerometer and Daily Log

- After you have worn your accelerometer for 7 days, please place it in the pre-paid envelope provided, along with this completed Daily Log and any unused adhesive patches and alcohol wipes, and send back to the research team.

How to fill in the Daily Log

- The log is divided into 7 days. Please complete each question for all of the seven days. Please try and be as accurate as possible—record the exact times if you can, or at least to the nearest 5 minutes of your estimated times.
- Start by writing the **day and date**.
- Then record the time that you **woke up**.
- Then record the **time you started work, the time you finished work, and the work setting**.
- Then record what time you **fell asleep**.
- Please record your sleep time first thing in the morning when you wake up along with your wake time.
- Once you have completed your 7 days of wear please return the log, along with the accelerometer, in the stamped, addressed envelope provided.

If you have any issues or queries please email or call Richard Mayne at rmayne02@qub.ac.uk, or (telephone number).

ID Number:



Daily Sleep and Work Log

Day and Date	Time woke up	Time started work	Time finished work	Work setting (Please state or enter N/A if off work eg. GP surgery, hospital ward or emergency department)	Time fell asleep
<i>EXAMPLE Day 1: Thursday Date: 01/01/2010</i>	<i>07:00</i>	<i>08:25</i>	<i>18:00</i>	<i>GP Surgery</i>	<i>23:00</i>
Day 1: Date: Time you started wearing accelerometer:					
Day 2: Date:					
Day 3: Date:					
Day 4: Date:					
Day 5: Date:					
Day 6: Date:					
Day 7: Date:					
Day 8: Date: Time you stopped wearing accelerometer:					

Thank you for your participation. After wearing the accelerometer for 7 days, please return this log, alongside the accelerometer, in the stamped, addressed envelope provide

Appendix 4 – Semi-Structured Interview Guide

1) How did you find wearing the accelerometer?

Prompt: Did you have any difficulties with it?

2) After looking at the data obtained from the accelerometer, do you feel this reflects a typical working day/week for you?

Probe: If not, why not?

3) How do you feel about your overall levels of physical activity?

Probe: (If happy with levels of physical activity) How do you manage to achieve your desired levels of physical activity?

Probe: (If unhappy with levels of physical activity) What is stopping you from achieving your desired levels of physical activity?

4) In general, are you aware of any health risks regarding levels of physical activity?

Prompt: Can you give some examples?

5) How do you feel about the amount of time you spend sitting down in work?

Probe: (If happy with time spent sitting) How do you manage to achieve this?

Probe: (If unhappy with time spent sitting) What is stopping you from being less sedentary?

6) How do you feel about the amount of time you spend sitting down outside of work?

Probe: (If happy with time spent sitting) How do you manage to achieve this?

Probe: (If unhappy with time spent sitting) What is stopping you from being less sedentary?

7) In general, are you aware of any health risks regarding sedentary behaviour/time spent sitting?

Prompt: Can you give some examples?

8) Are you aware of any workplace interventions that could reduce sedentary behaviour/time spent sitting and/or increase physical activity?

9) Would you ever consider using workplace interventions that could reduce sedentary behaviour/time spent sitting and/or increase physical activity?

Probe: (If yes) What interventions would you consider?

Probe: (If no) Why would you not be interested in using workplace interventions that could reduce sedentary behaviour/time spent sitting and/or increase physical activity?

10) Do you think the levels of physical activity and sedentary behaviour among GPs will be different in the post-COVID-19 era than prior to the COVID-19 pandemic?

Probe: If not, why not? If so, how?

11) Do you have any other comments?

12) Do you have any questions related to this study / would you like any further information?

Appendix 5 – Semi-structured interview transcripts

Participant 102

R - And yeah, first of all just to check how found wearing the accelerometer back in the autumn?

102 - It was OK. It was a bit sore from I remember. I don't know if I put it on too tight or something but it was fine. It didn't cause me any trouble.

R - OK, no, that's that's it alright. Yeah, it's just worth checking. You know how people got on with it? Do you think wearing it knowing that it was kind of tracking your movement and things like that, do you think that it influenced your behaviour?

102 - Possibly. Possibly. I didn't from memory I didn't go out of my way to change it, but it was quite painful at times. As I say, I think I just put it on too tight so at times it you know you were very aware of it. Put it that way.

EXPLANATION OF RESULTS

R - So looking at those results and kind of in general, how do you feel about your overall levels of physical activity?

102 – Em, since that time I've been more aware. Obviously when the monitor was on, I didn't know my step count. Since then, I've been more interested in actually got Fitbit or a similar type, for Christmas, and so I'd be more interested in how many steps I'm doing and trying to like encourage myself to do more. Is interesting just to see what it showed back then and definitely I'm trying even to increase that more.

R – And do you find with wearing the Fitbit and getting that data, does that help to encourage you to be more active?

102 - Yeah, I think it does. Obviously the aim is the 10,000 steps. And that's what I strive to, now I've a young family, so you're constantly running after them. And it's not just as easy to head out for a walk or whatever, at times you have to always work around them. But yeah, it definitely has encouraged me to be more active and also with work, I'm definitely more aware that I'm more sedentary at work and now I really try to get out at lunchtime if the weather is OK for a quick walk, even if it's just 1000 steps at least, then it's interesting with the figures that I'm doing only half the steps on a work day so it's worthwhile just to push myself and even a short walk is better than nothing, it helps.

R – And do you find you can manage to fit that in on a workday?

102 - Not always, no.

R - Why is that then, you know, you can't always fit it in on a workday?

102 - 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, and, em, I suppose it is just about setting the time aside for yourself and heading out. But I suppose weather even as well if it's wet and dreary, I probably prefer just to push on with some work rather than head out to walk and get soaked.

R - Yes, yeah, because you don't want to be sitting soaking wet all afternoon. Yeah. I don't want to be patronizing with this question, but in general I've just been kind of asking people about how aware they are of any health risks regarding levels of physical activity or lack of physical activity.

102 - Yeah, very aware. I'm very aware of health risks. I have an interest in lifestyle medicine or it's a developing interest in lifestyle medicine and not that I've done any like major learning about this, but it's something that I'm thinking about for the future with regards to education for patients and things. So it's definitely something I'm interested in and aware of for myself.

R - And are there any particular conditions that you can think of would be related to physical activity or lack of physical activity?

102 – Everything... mental health, diabetes, blood pressure loads.

R - OK yeah. And. So, and specifically thinking about work, how do you feel about the amount of time that you spend sitting down when you're in work?

102 - Em. Needs must, I suppose is the bottom line. Um, the thought of a standing desk. My practice manager did offer me one. He said he could maybe like look into installing one for me if I wished I wasn't that keen. I sit a lot, I know that, but I'm at a computer, I'm using the phone, I'm typing. I sort of think it comes with the job so.

R - And do you think that's changed with the covid pandemic?

102 - Yeah, I think prior to covid because people were booked in. I tended to walk down and meet them from the waiting room and bring them to my room, which is maybe 10-20 steps so you were always getting up off your seat. Heading out, coming in, sitting down, maybe examining them. So yes, there was much more activity. Now it's phone call after phone call after phone call. Maybe up and over to the nurse and up to leave a prescription and back down, and then you've maybe three or four phone calls. So definitely much more sedentary with COVID.

R - OK. And uh, and apart from the standing desk you know, are you aware of any other workplace interventions that could help to reduce or interrupt setting time?

102 – Em, not really know.

R - OK yeah, and you mentioned standing desks and the fact that you were, you know, potentially offered one. How come you? Is that something you're not that keen on then yourself?

102 - Yeah, I think it was maybe my practice manager installed one for themselves because they had a sore back and this is maybe two or three years ago and he just mentioned, oh do you fancy one? Because he knew he's quite handy and he I think he knows how to do it, but just the way my room is set up, we have shelves above our desks so it was going to be. I thought there was going to be a lot of hassle. Trying to practically install it and I'm not really sure whether I had, I would have found benefit from it or enjoyed it. I didn't really know, so I declined at that point, but I'm sure if I wanted it I could ask for it. I'm just not sure it's. I think it would be interesting to have. I'm I'm not really sure I really want it. If that makes sense?

R - OK, yeah, no, that's that's good to know as well. And are you aware of any initiatives aimed at encouraging GPs and their patients to be less sedentary and more physically active?

102 - I've heard of Parkrun practices, that's all. I'm not a runner.

R - OK, I'm have you heard of the RCGP active practice Charter?

102 - No, I haven't.

R - Yeah, that's another thing, but it doesn't seem to be. There doesn't seem to be that much awareness of it and. In in, in your practice, is there much of an encouragement you know for people to be more physically active? Or is it kind of just up to the individual?

102 - I think it's up to the individual.

R - Yeah, and as GP's in general, do you think it's important that we consider our own health choices in terms of our sedentary behavior and physical activity in terms of being role models for patients and how we interact with patients?

102 - Yeah, absolutely yeah, I think there's no point, like it's practice what you preach, isn't it? A bit, yeah. Very important.

R - OK yeah because another in another interview someone had the opinion that they you know, people should still be able to relate to their GP as well, so you know there sometimes if they came in and everybody was, you know, skinny, and tanned and sometimes you know they might not be able to feel that as open to their GP about that sort of thing.

102 - Yeah yeah, except that view. I suppose I'm not, like as I said, I'm I'm not a runner, I'm not super fit. I'm not a keen walker and tramp the streets or anything. But I see the benefit in it and I definitely encourage patients to do it. But yes, bring a bit of realism to it that, you know, the weather doesn't make it easy. Young kids don't make it easy. You know there's always other things to pull away your time, but I think you know the the desire is there and you're aware of the health benefits and physical benefits. And I think patients understand that yeah.

R - And, uh, you know, given the fact that you were a lot more sedentary on a workday and and less active, can you think of any ways? Anything in general that would help to make you more physically active and less sedentary?

102 – Em, I think the lunchtime walk is a good idea, just really encouraging and trying to get out even as a practice it would, I've often thought it would be nice even as a couple of colleagues to get out for a walk. Even like we don't really do a lot of meetings or anything. Practice meetings, but it would be nice even to go a walk with your colleagues even before after a quick practice meeting just physically to help each other get the steps in and you know, a head breather... What's the word... breathing space? Almost like to do that together, but I think everybody just wants a couple of minutes to themselves to catch their breath in the middle of the day. And some people prefer to go on Facebook for a while. Some other people maybe want to phone home. Or you know, there's other things that people maybe want to... so I'm not sure like you know, 9, 10, 11 o'clock when you're busy with your workload. I'm not really sure what we could do to encourage our less sedentary behavior but, maybe for lunch time it's a possibility.

R - And do you think if there was less workload that it would make it easier to be more physically active?

102 – Possibly, em, I'm not sure. I I'm not really sure. A standing desk would likely make you stand more and make you move around a little more, while you work, so I maybe it's it's offering those sorts of things or are considering those sorts of things rather than sitting to do your work. Standing or having, you know, your prescriptions that you have to sign in a different place or, you know, physically having to move around to do certain jobs maybe would be helpful but as well everything's in my room. My bags there, you know, everything is to hand and. It's awkward, maybe if you had to move around to different rooms to do different tasks, how that would work professionally.

R - Yeah, and even space and things like that.

102 - Yeah, and with social distancing and covid, you know that's obviously at the minute difficult too.

R - And, uh, how do you feel about you know if you did have a standing desk, do you? Would you? How do you think you would use it if it was, you know, height adjustable and you could sit behind it or stand behind it. If patients were coming into the room, how do you think you would use it?

102 - Yeah, I suppose that's possibly why I didn't want it, because I wasn't sure how I would have used it. I'm at the minute, probably, em, I would just pick and choose and maybe stand for awhile and then maybe sit for a while with, you know, stand for an hour first thing and then sit for awhile and then maybe stand again in the afternoon. Something like that. I probably would go between the two. If patients were in the room, I imagine I would probably want to lower it

so that I could sit and talk with them. More face to face more on a level playing field than stand. I've heard of GP's that for sore backs and different things that have just created their own standing desk and like have their printer and then put their monitor their keyboard on top of the printer so they are standing and actually encourage the patient to stand with them, and do their consultation standing, but I have no doubt that that would reduce the consultation time, so people aren't going to get as comfy and aren't going to talk, but. If we're really talking about trying to reduce sedentary behaviour, I'm not sure. I don't know whether it's probably more for different reasons. Asking patients come in and stand or standing with patients is probably for other reasons other than being less sedentary.

R - Yes. Yeah no, that's good point. Uh, no interestingly. I mean, I've been researching this this area for a little while, and before the pandemic I was happy enough. I didn't worry, it didn't really think I needed a standing desk or anything like that. 'cause I would have tried to be active. You know, whenever patients were coming in tonight and and things like that and then it was just with the pandemic last year, that really got me thinking I was getting fed up just with doing everything over the phone initially. And having much less opportunity for movement. So I did just put my keypad on the. You know, the keyboard on a box of printer paper and then my room has a has shelves where I put the monitor up in the shelf behind the desk. And I found that I did prefer that, it's just not as easy to adjust than like a proper standing desk. But yeah, it's whenever people are coming into the room now with that's happening more often, I do have more of a. It's it's not such a an ad hoc thing. There is more of a proper standing desk that I have, but I generally would sit down when patients are in the room with me, yeah? I think it is important to maintain that that interaction and and feel like people can be open with you, because I think otherwise it's the. Sometimes it's not the first thing that they talk about that they're really in for. You know it's the second or third thing that is really their concern, and that might not come up if you're just be like yeah, they're being ushered out the door straight away.

102 - So yes, yeah, it's almost like a takeaway service. Where it's like turn up, you know you're standing together talking and yeah it's about X or Y. And then yeah, I think it's just more of a...

R - Transactional maybe?

102 - Yeah, yeah whereas you sit down, you're taking the time, you open your posture yourself. You're more open body language, yeah?

R - And definitely also I wouldn't want to be standing up if the patient was sitting down either. I think that would be a bit awkward, but I did. I did a presentation a few months ago where somebody said about a. I think it was a GP who is retired now, but when they used to be running behind time they would remove the patient seats from the room to make the consultation go bit faster. To make up time again. But I certainly wouldn't be condoning that myself.

R - Those are all that's kind of all the questions I have for you, so I was just wondering if you have any questions yourself? If you like any to make anymore comments or anything like that/

102 - I don't think so, no. No, it's very interesting.

Participant 104

R - So how did you find wearing the accelerometer?

104 – In a way it wasn't a problem, but I think how long did I have it on after so many days I actually got a bit of a skin reaction to it. OK, so I got quite a nasty like a burn or whatever after, but that was after four or five days or. You know towards the end so, but you know. Just bad luck.

R - I'm sorry to hear that. Yeah, because we certainly got enough data there that you know there was good good good readings from it anyway. And do you think whenever you were wearing the accelerometer? Do you think you changed your behaviour as a result? Do you think that influenced it?

104 - You know, I, I tried not to, you know, because you know I I don't know. I don't know I can't say for sure but I had not. If so, not deliberate.

EXPLANATION OF RESULTS

R -But looking at those results and in general, how do you feel about your overall levels of physical activity?

104 - Well, I I would say that I probably. I would like to and I probably should do much more, you know, but that's well really time constrained. Now I have to say over the last months now I started to try to do, well with work so probably three or four times a week. I do a long walk, you know, and with that try to get I. I finally had to give in and get myself a new telephone and that tells you how many steps you do. OK so and so I'm trying to if possible to get sort of above this 10,000 steps a day. Whatever good that may bring, and I'm so far on average, probably three times a week. I'm able to do that.

R - Yeah, that's that's that's good going and is is that on a work day that you're able to manage that?

104 - Yeah, well it depends. Yes, it depends what work day see. My work day is that I I work basically Monday to Thursday I work up till 6:00 o'clock and then on average like this week for example on Tuesday and tonight as well. I'm again on for the out of hours. So as I know work till midnight so. On those days I can't, and on average there's probably two to three days a week that I work late. Either by doing minor surgery or being out of hours, or I'm on for forensic medical work. And then of course I'm restrained with that, no?

R - OK yeah yeah, and in general I don't want to be patronizing with this question, but it's important just to explore. You know in general, are you aware of any health risks regarding, you know, insufficient levels of physical activity?

104 - Very much so yeah, see I'm coming up to be this year 60 you know and I know that I should be doing more. You know I'm lucky that. I even though I'm not really that active. I'm not putting on the pounds, but I just know that I'm not fit.

R - Are there any conditions in particular that are related to physical inactivity that you're aware of?

104 - Well, I think in in in general is just your cardiovascular system and blood vessel calcifications. You know may that be your brain or your heart. And that of course then compounds in the whole body and and in the end determines how fit mentally and physically you are the next 20 years you know.

R - And how do you feel about the amount of time that you spend sitting behind during the course of a of a working day?

104 - Well, I try to when I'm working to, you see I usually get out to get my patients in, you know, so I try to not sit the whole time and there is well. And surprisingly if I look actually I'm on your statistics. I'm actually more active when I'm working then when I'm not working. So for me work might be my saving grace that keeps me reasonable active, you know but it's it's difficult to get more movement or non sitting time in it. You know it's probably right, you know.

R - Yeah, and uh yeah, what stops you from from from spending less time sitting?

104 - Well, it's it's probably that well. For one thing, if I have a face to face with a patient, you have to sit. You know 'cause they're sitting so you can't stand and they're sitting. Uh, and probably also to create a comfortable atmosphere for consultation. I think it's better if both people are sitting down. You know that just ritualizes more that everybody can feel comfortable to talk. You know, I don't think if you would be standing that people would be as comfortable and relaxed to tell you about themselves as if you're sitting. You know? Yeah, now then, of course, once you have to start writing things up or do your computer work. That is something where I'm basically sitting there 'cause my computer is on the desk and I have to sit in order to access that, you know, but I guess what your study is aiming to use to see. Well, could you also do that standing and I would, things like that part of the job, which is probably. I don't know how much a third or 40% of your job where you basically have to look up computer results or go through hospital letters. You probably could do on a standing desk. There's no. You only sit because you're used to sitting, you know and you always have been sitting doing that, but there's no good reason for that.

R - And what about you know, the changes with consulting as a result of the pandemic with more remote consulting with telephone and things like that, do you think that affects things?

104 - Well. Yeah, well again like in a way, if you wanted to make changes you could use it as a positive. 'cause obviously if you do a telephone consultation. You could make a handstand or lie in your bed or sit or stand whatever you know, it wouldn't make much of a difference. You

know, it would be different, of course, if you have a video consultation then you also need to have a comfortable relaxed body language, which is probably better to achieve when you're sitting. But if it's just a plain telephone consultation, you could do it standing. Yes, you know so.

R - And what about you know, apart from standing desks, are there any other workplace interventions that you could think of for that you've tried to reduce the amount of time you spend sitting?

104 - Well, I usually try to. You know, in in order for myself and I said, all those little journeys you have to do if you have to leave your prescriptions and and that that I get up off my backside and bring it over to the receptionists you know and and. And that probably accounts for the majority of my movement during the day. You know that you have to go this way or that way you deliver something and and even on an ordinary clinic day there is probably is enough disruption that you have to go, you're ask to see somebody in the treatment room. You have to go confirm something with somebody else and I. Maybe because I'm a bit more old school rather sending a text message or phoning somebody I usually prefer to go there and speak to people in person, but that's just just me and my old habits.

R - And do you think you personally would ever consider using a standing desk or any other intervention?

104 - Well, to be honest, before you came up with this it hadn't crossed my mind, you know. But then again, there's there's no reason not to do that and I. Actually, I've heard that a colleague of mine, she actually has installed some super fancy expensive thing which you click at the side of the desk and then you can lift it up and then you click it and you lift it down again. You know which. Well, you know, I mean. That's that sounds like a straightforward innovation, you know and. I guess why not, you know? Like once a consultation is finished and I have to do blood results and look up hospital letters. There's not really any good reason. I guess if you at least have the option you know then that would, yeah, it would facilitate that.

R - OK yeah, and are you aware of any initiatives in encouraging, GP's and their patients to be less sedentary and more physically active?

104 - Not of anything acute. I know it like for example in the hospital they have a scheme that you can get a bicycle. Right, but that's more for getting to work, not being at work, you know, but which I think is great, you know, I've done that. I on the one day that I work in nearer by, I usually try to cycle to work right and I think far more people should be doing that. But it's been a cultural thing here. But I'm I'm not aware you know. Well it would be something for the trust to say right? We give you a grant that you can invest into a fancy standing up desk. I guess you probably would have an uptake.

R - OK, and have you heard of the parkrun practice initiative?

104 - The Parkrun initiative, eh, not that I can recall it, but I know every so often this, see we also have a social worker wanted to install walking group and you know, like all those things that is good. And if if you get people with that yes. But I think actually it's better if people. You know, I'm always a bit cautious with. If you have an initiative. Which is em, tries to get people to do one thing or whatever, you know, I think it's better if you are able to integrate things into your daily routine. OK, you know, for example, like your way to work. Once you change over that, you can either walk or cycle then and if that becomes a habit then that's for life you know. Likewise, if at work if you establish that, right, when I finish seeing my patients and I look at my results, that's when I stand up, you know? Or I do that on a different computer where I have to stand or something. I think then there's a better chance that you maintain it. Rather than if you have an initiative which runs out at some stage and then it was all well meant.

R - OK and have you heard of the RCGP Active practice Charter?

104 – No haven't. I probably should have, but I have to also admit that I am very bad at reading my emails, so it might have been somewhere down the line of my emails, but not that I recall it.

R - It doesn't seem to be too well known, but that's just something that I thought was worth checking about and then, as as a GP and as GPs in general, do you think it's important that we consider our own health choices in terms of our sedentary behavior and physical activity in terms of how we are role models for patients and how we interact with patients?

104 - But yes, yes you know. I think role model models can go into two directions you know 'cause some. Say for example, if you see and also if you go to an orthopedic surgeon, you know in particular where I come from in Germany, they're usually all slender, slick and well tanned. Right and, but that's probably what you expect from somebody who wants to fix your knee after sports accident or something like that. You know. So that's. Maybe just the same as if you go to a beautician you know you expect a certain appearance in order to be comfortable, whereas I think as a GP because. I'm not always sure. I think your role as a role model grows probably to certain extent. But if every GP is a slender, slick, healthy looking, well tanned person. Em. Patients are not slender, slick and well tanned and successful. You know. And those who come to GPs are very often those who are less fortunate in life, you know so. I think if you are too. High up there, it'll be very difficult for somebody who's inactive and overweight to admit to that if every GP they go to is the embodiment of physical health. You know now of course. It has to be probably a little bit of a balance. You know if you come to your GP and and he's still smoking and has a glass of whiskey on his desk, that's probably also not so good an idea. You know so. Well, I think a certain role model part is good and of course for yourself you know, see, I'm going to be 60 this year and I got the job in my practice, eh, from one of the predecessors who died within a year of his retirement. And I've seen a few GP's who had a very early demise after their retirement, and if you come to that age, it makes you a little bit aware that. It's worthwhile to keep your good health up.

R - Yes, very good. OK, that's that's all the questions I have for you, but are there any other questions you have yourself or any other comments or anything you'd like to add?

104 - No I say I enjoyed to participate in that, and if if the outcome is that people can be persuaded or encouraged, or there's anything to improve physical health and and keeping mobile, I think that's great, you know. Well done and good on you.

Participant 105

R - How did you find wearing the accelerometer?

105 - Yeah, it was fine.

R - OK yeah, good and do you think when you were wearing it do you think that changed your behaviour at all, you know?

105 – I don't think so. So actually we were having a very bad week. We had a covid outbreak in our surgery. My mind was just on that so I don't think it changed.

R - OK yeah, very good.

105 – The day I put it on. I just thought, "Should I put this on 'cause I didn't know if I was gonna have to isolate at home but I didn't have to in the end."

EXPLANATION OF RESULTS

R - But kind of just reflecting on that and and kind of in general, how do you feel about your own levels of physical activity?

105 - Well, I suppose whenever I did that I also I have a small child, so I suppose a lot of time on the floor when I'm at home, so that would probably affect it. But over COVID I have exercised more and I go go for a walk every day. So that would be the 47 minutes and I would sometimes try to go for a walk in the surgery. Although in the minute I have no time. I barely have time to eat my lunch. But in in other times I would maybe just take a 15-20 minute scoot out. It was more as well to not sit in the tea room. You know to get away from people. Yes they would go for a walk as well.

R - Yeah, OK. And so are you kind of happy with your levels of physical activity at the moment, then?

105 - I thought I was doing more. But I was out for a walk this morning and they're probably getting longer because my children are getting older, yes. And I suppose as well it was winter so I'm probably doing more now, in better weather.

R - Yeah there's a lot of factors on it. Without being patronising, I'm just wanting to gauge kind of peoples understanding... but in general are you aware of any health risks regarding not having sufficient levels of physical activity?

105 - Having extra weight isn't good. I did lose weight over the covid pandemic as well, which is when I started walking more. Yes, lots cardiac. Lots of different things, yeah. I think walking is good for our mental health. I really like to be outside now.

R - Yeah, yeah, that's pretty much the same as everybody's been saying so.

105 – It used to be that going to the gym was good for my mental health as well and then when I had my baby I stopped being able to do that. And obviously now the gyms are all closed.

R - Yes yeah and thinking then about work, how do you feel about the amount of time that you spend sitting when you're in work?

105 – It's definitely worse now because of telephone triage and then I suppose at that period of time we are practice really changed and that you really didn't leave your room unless you really had to because of covid. And you know, I would be quite active and be like, I'm going out to reception to hand stuff out like no one really would really ever come into my room. But now maybe not so much. I had a chair outside that people left things on and then I put it back. You know. So I think covid has affected that.

R - And do you think how do you think things will be moving forward? You know with lockdown restrictions and things easing with the vaccination rollout and things like that. How do you think it will impact you?

105 - I don't think I'm you know, I need to stay in my room as much now. So it is definitely improving yeah.

R - OK and what about you know in terms of the consultations moving forwards. Do you think that if there's more remote consultations than prior to the pandemic, do you think that will be a factor on your physical activity and sitting time during the working day?

105 - Yeah, well you do get up when someone comes in the room. Then you examine them. So if you're not doing that then it will affect it. And even like you're not going out to do home visits and things as much, just not to the same level.

R - OK yeah exactly yes yeah.

105 – I hope it changes back though.

R - Yes, yeah, it's hard to know kind of what things will look like moving forward because people kept talking about, like things getting back to normal, but I think there will always be differences in terms of how things are being done in primary care you know you know longer term coming from this pandemic, but it's kind of hard to know moving forwards. And, uh, so are

you aware of or do you have any sort of interventions in the workplace that could help reduce your sitting time or interrupt it?

105 – We don't do anything, no! We don't do any interventions, no. It's only your own personal ones, you know. Like one of my partners, she used to go out and walk around the car park to get up her steps. You know, that's just everybody's own personal ones. There wouldn't be a policy, no.

R - And what was the reaction to, you know, one of the partners doing that?

105 - Well, no everybody, yeah, and I would have gone and anyway, yeah, that's fine. They just sat on and eat their lunch. They don't mind.

R - OK, yeah OK. And is there anything that you or any other interventions or anything you're aware of that could help?

105 – We'd talked about the standing sitting through the standing desks, and I suppose when I worked in hospital I stood a lot more. You would have stood, you know, if you're writing up notes in A&E you would have stood all the time. Whenever we did the flu clinic, actually, I stood, obviously you stood all day. I was knackered...

R – Yeah

105 - We did a 8 hour flu clinic on a Saturday. I was so tired from standing, and I stood the whole day. So I suppose there's more standing when I do the covid vaccines as well. You don't really sit down, you just stand the whole time.

R - And do you think you would ever consider trying to adopt any interventions in the workplace to help reduce your sitting time?

105 – I would be happy to do it. I don't know about anybody else would be so... I did say that to somebody one day I was like, you know, they have these standing desks and, like, I think they said, do they have them in out of hours somewhere, the standing desks maybe?

R - I don't know. In the survey that we did, actually I mean, the thing is, people that responded to it were more likely to be interested in the physical activity and things. But 6% of the 352 participants did have standing desks in general practice, so that was interesting to see.

105 – We are planning to get a new surgery, so I suppose it's something that could be looked at as well, like some of the practices I worked in, as a trainee and things. You know you would have had different rooms that you're in throughout the day. You would have got your consulting room, then you would have triaged somewhere else, where we don't have the space for that. Things like that would help with physical activity, you know, moving about more.

R - Yes, OK, yeah.

105 - Maybe if you had a triage room then you could put in a standing desk then.

R -Yeah yeah. And you know if you were thinking about a standing desk. How how do you think that would work? With patients you know, would you be happy to stand if you were consulting with patients? Or would you prefer to be sitting down when they're coming in face to face?

105 - I suppose during covid we don't sit down as much because then you kind of like everyone's kind of hovering because of the restrictions you know. And the patient's only in for like 2 minutes for you to examine them. So you're more used to, but I think it's better on a personal level to be sitting down when you're talking to them. So it would be maybe more on those hours in between the consultations if we go back to, you know, surgery and then not having surgery for a few hours in the middle, then yeah, I don't know if I could stand all day. I mean, I'm quite young. Some of my partners are older, although they are quite fit but you know they might not be so keen.

R - Yeah, it's just having the option I suppose as well. Yeah, not feeling like you have to be standing all the time.

105 - When you go into reception. You know when someone gives you a pile of scripts to sign, you have to sit down 'cause you're down at a low desk. So if you have the option that you had a surface that you could choose higher up you probably would use it.

R - Yeah, yeah. Are you aware of any initiatives aimed at encouraging GP's or their practices and their patients to be less sedentary and more physically active?

105 - I think there's, isn't there one for Parkrun.

R - Yes.

105 - Well, I don't, I don't know anybody who actually does it here. But yes, I suppose during covid that's probably not happening so much. I know some GP practices and things have walking groups and things as well and have done in the past.

R - OK, and have you heard of the RCGP Active Practice Charter?

105 - I think I got an email about that recently. Is that the one the parkrun thing was on?

R - I think it's kind of similar to that, yeah, but I think it's like a separate idea. Yeah, that's just another thing, but it doesn't seem to be that well publicized or or known of. And as as a GP, and as GP's in general, do you think it's important that we consider our own health choices in terms of our sedentary behaviour and physical activity as like a way of being role models for patients and how we interact with patients?

105 - Well, yeah, well, I suppose it's like we used to have a nurse who is on the heavier side and she used to do, do you like a hypertension clinic. I think it's very hard to tell patients about their lifestyle choices if you don't, if you look like you don't look after your health, so there's that. There's that as well. I suppose I do see the patients out walking when I'm walking when I'm not at work, which is good. Not that I really want to see them but yeah, but they do say like "oh

there's doctor ... she's out for a walk with her children, you know. So that's good from that point of view. In our practice the GPs are probably quite active actually. Nobody's particularly overweight or everybody would be quite active.

R - Yeah, OK. And you do you have any thoughts or reflections on about you know what we've been talking about, or any questions related to the study or anything?

105 - No, I suppose we all want. I mean, they talk about 10,000 steps. So you said I was doing 10,000 on the days off so it was not only a few 100, so you know, obviously that's concerning, but I think I knew that before I did this study, I knew that we weren't doing enough steps, so it would be good to improve that.

R - OK, but do you think that's doable? You know over the course of a normal working day?

105 – Well I think even during the winter you know it's just dark and wet. I wouldn't even have gone out for a walk when I got home from work, so I think in the summer it'll improve. You know, I can say right, I'll go out for half an hour. So I did try to go for a walk at lunchtime so things maybe calmed down a bit. Because I did enjoy it. Yeah, I. I don't know. I suppose I could put on my walking gear and I had my hair tied up so nobody knew who I was, you know, I didn't look like Doctor Robinson so it was fine. Yeah, it's not very. We're not in a very good area for nice walks or anything.

R - Yeah, that's also a factor.

105 – I do hate sitting down all day. I kind of wonder if somebody funded standing desks, like from the board or something, then people might take it up.

R – Yeah, I suppose that's something they might consider.

Participant 106

R - Just thinking about your back to wearing the accelerometer, how did you find it?

106 - Not too bad. I find it maybe just a little bit. You know you're aware of it there on your thigh, just a little bit, not even itchy, but just a little, you know, a little bit of pressure, I suppose, but I got used to it, you know? It didn't bother me too much, Richard, probably more, and I'm thinking more obviously in work when you're thinking about crossing your legs or something, but it wasn't a big deal to have to wear it, you know. Although I was probably glad to get it off.

R - Yes, I know it is quite a big ask, you know, wearing it for a week. But it does give some really good information as well, which I'll show you in a second. But do you think you would have changed your behaviour any as a result of wearing the accelerometer on your leg, knowing that it was, you know tracking your sitting and moving? And that your sitting and moving was being monitored.

106 - I don't think I did, you know, specifically on the days when you're in work, I don't think I did. I'm not sure if I can remember, you know? Yeah, you're conscious of oh, I must get so many steps up today, but I definitely don't think it affected my days in work because they are so set anyway, you know? And there just isn't that opportunity to get up and move a lot, so I don't know, I can't recall whether I think, obviously you're conscious of it and you think you know I must prove that I'm an active person, you know, and so I may have done on the other days, but I don't think it would have affected the work days.

EXPLANATION OF RESULTS

R - So yeah, and then just in general, you know, in light of those results, and just talking about things in general, what do you feel about your overall levels of physical activity?

106 - Well. I know that I don't move enough on the workdays, obviously, you know you're in work for 10 hours, but I suppose it, and I mean, I, I'm not an overly sedentary person, but when I think lockdown has made us more sedentary and I think that we can say oh, I'm gonna go out for a half hour walk and you go out for a half hour walk but actually the rest of the day you're sitting, maybe scrolling on your phone, or you know you're not. You're not doing too much else you know, especially with lockdown. So we probably haven't been moving... whilst, and I can't remember when that was done, Richard, but I think just in general, we've become even more sedentary because you're not even walking around the shops or walking. Going to meet someone for a coffee or help. You know, that's coming back, but I think I've become even more sedentary through lockdown, you know, like as I say, you try to either do a run or half hour walk, but after that then you're still pretty sedentary the rest of the day. You know apart from, obviously cooking the tea and doing the housework and stuff, but in general I mean, I, I don't sit and watch TV for hours, but I certainly think, yeah, through lockdown you would have found yourself just sitting, as I say, scrolling through your phone or something on the days you're not

in work, you know, because you weren't doing much else so. But so just yeah, trying to be mindful of that and try to get back to moving a bit more, I suppose you know. I read something recently about linking into what you were doing, but rather than telling people about, you've got to exercise for this long a day so many times a week. Just saying about moving a bit more, you know?

R - Yeah, I see that the accelerometer - that was that study was during October. It was whenever the lockdown restrictions were coming back in again. So there was definitely would have been an effect on it, certainly, which is important to consider. Yeah, so then now with restrictions easing again, do you find that you know you can more active be with shops open and things going on? You can meet people outdoors and it that means you are more physically active then as a result?

106 - Yeah, I mean I would say like I would have, I'm like I'm not a serious runner but I would have run parkrun. I would have run, you know, several times a week just you know just under 5K, but certainly through the winter and I'm, you know, more of a fair weather runner so I've definitely got back to that again, you know, which wouldn't have obviously shown up in October. But yeah, definitely just trying to be more mindful of daily exercise and daily. Yeah, just even not sitting sitting here as you say, just being up and doing things rather than sitting. I still think we're not really, you know what? We're not really like about a lot more at the minute. Yet, you know. Apart from going out for walks or whatever it is, I don't think we're at. I mean, you know we're not as I. I still don't think we're as active as we were, pre-COVID, you know.

R - And this is, obviously I don't want to be patronizing with this question, but it's just interesting just to explore with, you know, GPs, are you aware of any health risks regarding physical activity levels? Or for people being not sufficiently active about how that affects their health?

106 - Well it's the usual... weight gain, diabetes, heart, blood pressure, probably problems with your joints. Stress probably as well. Mental health. Yeah, everything. All of those things Richard yeah, you know.

R - Reflecting on your own experience, I mean, how do you feel about the amount of time that you spend sitting while you're in work?

106 - I don't think it's good. I don't like it. I hate the fact that I'm sitting for 10 hours and I look at my Fitbit and I know I've only stepped 1200 steps everyday I. I hate it. You know, I hate being in front of a computer and the biggest exercise I get is going upstairs to get a coffee or my lunch in the day, you know. And as you know, and I think you've alluded to it, you know, now, we're not even getting up to get people out of the waiting room very much now. So it's just, we're just sat there. I don't like it. I don't like those two days. I wouldn't like to work full time because that would just be, you know, terrible. And the problem is. You know, I'm not. I'm not motivated enough to come home and then go out to exercise or whatever. You know I come

home and it's close to seven o'clock and you eat some tea and you. Just sort of like. You know you're nearly overwhelmed from the day, so you're just by the time it's eight o'clock you're tired, you know. So I'm not good at fitting in exercise on those days when I'm working. I don't like the fact that I'm so sedentary on those two days.

R - And I think that's going to be a recurring theme. You know, I did an interview this morning and it's the same thing. Pretty much exactly the same thing as you're saying, and that's my experience of working in general practice as well, which is kind of why I got interested in researching this area, because yeah, it is. It's interesting how it impacts our health. Are you aware of, or do you know of any workplace interventions that could reduce or interrupt your sitting time?

106 - Just things that you hear, I suppose, things that you that you hear, or like, I've read. What is that Doctor Chatterjee? Is that what's his name? The book The Five Pillars book? And obviously there's bits in that about getting up at your desk and doing strength exercises and movement. And you know, I, I know, it's all these good ideas like go and walk around the block at lunchtime or go and you know. But it's so hard to do when you're under pressure. Obviously there is, I think, I don't know if it was in your study, about standing desks. And then, just as a practice, I suppose that you know, I know about parkrun practices and trying to motivate people as a practice to do physical activity and movement as a team and encourage patients as well. All of those things.

106 - And what do you think about standing desks? Or do you know anybody that has one in general practice? Or is it something that you would consider yourself?

I think Nigel has one, doesn't he? Prof Hart?

R - Yes.

106 - Apart from, I think he's the only one I know of. I wouldn't mind. I wouldn't mind trying it, Richard, yeah. I think he's the only one I know.

R - In the questionnaire that we did, I know it maybe isn't 100% representative of what all GPs will be like because it's probably people that are more interested in their physical activity and things that responded to it. But six 6% of people said they had active workstations like standing tasks, which was quite interesting. So it can be done, but it's just changing the culture and things as well. Apart from the parkrun practice initiative, are you aware of any other initiatives, you know, encouraging GPs and/or their patients or the practice to be less sedentary and more physically active?

106 - Thinking of it, I can't think of anything else, Richard. I'm thinking of anything I've heard of. I don't think so.

R - Have you heard of the RCGP active practice charter?

106 - Oh I have, you're right. I knew there was something in the back of my mind. Yeah, I think I think I've heard of it. I haven't read it or looked at it, but yeah.

R - OK, and as GP's do you think it's important that we consider our own health choices in terms of sedentary behaviour and physical activity? You know in terms of being a role model for patients and how we interact with patients?

106 - Absolutely. I mean we can't, we can't expect patients to do things or be, you know, prescriptive or directive in giving guidance and advice if we're not taking that ourselves, you know, I think we have to be in all that you know everything in terms of diet in terms of mental health in terms of you know, activity. You know in terms of you know, weight loss, whatever it is. I don't think we can sit there and be expecting patients to do things that we're not going to do ourselves, definitely.

R - OK, and how do you feel like the culture is in your practice in terms of encouraging people to be more physically active and less sedentary? Is there any sort of thought of that in practice day to day?

106 - Probably not day to day. I mean, I'm in that practice 4 1/2 years. I mean there is a general, em, what's the word, mindset maybe of people being active in their own individual lives, you know, on a personal basis. The first year we did, we did the marathon, the team relay, as a practice. Just because I suppose that came out of the fact that there were a couple of us there that that run. You know, don't get excited, like we run parkrun or we do whatever so you know the practice manager and the partner and myself and the registrar at the time, one of the nurses at the time, you know we did the relay, so that was and then the next year. I can't remember what happened. (The partner) did the marathon on his own and but. What was I going to say then? They changed the day of the marathon, and then that sort of threw us up in the air. But I mean, in general you know people who are there are. Well, some of us are more active than others, I suppose. But as a practice or day to day, as you say, in terms of just the culture of. I, I guess not really. Am I making sense? Yeah, you know. Not in terms of you know we're all going to take a break and move around a bit. Or you know it's not. It's not like a common theme as such, or a collective idea, if I'm trying to get my point across. I'm not really making sense, you know. As individuals there are a number of us that would exercise, and you know, we'll chat about that. Or, you know, the practice manager will do her zumba class, or you know I'll be running. (The partner) will be running, you know, the registrar too, I think who did take part in your research as well has been very proactive and has encouraged all of us to be more. To think about lifestyle medicine and you know things like that. But I think, not in a collective way, I suppose. Is what I'm trying to say?

R - And if you were using a standing desk, you know one that can go up and down, how do you think that would affect interaction with patients, you know, would you consider standing up when patients were in the room with you, or would you prefer to be sitting down, you know, if you're bringing people in for face to face consultations?

106 - I'm not that tall anyway, Richard, but. But I probably still like to sit. I suppose. I don't think I like the idea of standing over them, or I think that still isn't that, you know, gives a, that idea of authority, if you're standing, I don't think it's there sitting. I don't think that's I don't think if I was on there, I think if I was the patient, I wouldn't like the doctor standing.

R - And yeah, you don't. Yeah, you don't want to turn into like a fracture clinic or something!

106 – I've had that experience with a relative in the last two weeks. So yeah, exactly exactly. Yeah, I mean, it might be good for us. It might be we might not have people sit too long, but yeah.

R - Yeah no, I think that's fair enough and yeah, that's that's all the questions I have for you, but is there any other questions that or thoughts you have or any anything else you want to ask me or anything else you want to reflect on?

Just want to I suppose I just want to encourage you and I suppose I mean anything that we can do to make it better for us I suppose. But again, as you say, it's a whole cultural thing, isn't it? You know. But I, we can start. We can start somewhere as a practice is, you know it's not. We shouldn't need to wait from on high to be told for everyone's going to do. We should make a start, you know. But yeah, I guess it's just that isn't. It's just that we get so bogged down with the day-to-day work, don't we? And we just we neglect ourselves. It's like everything. I suppose as well, you know, in different professions, but yeah, I mean I just. Hopefully you'll get to chat to the registrar. She's been very good at, as I say promoting self-care and lifestyle medicine. So I, just this morning, had a look at the British Society for Lifestyle Medicine website as well. So I think it's something that's gonna be more important as, well, it is important, but just as it has to come to the fore, you know now, I think it really does, so, good luck and keep going.

Participant 108

R - I've got a list of a few questions and then some are a bit more ad hoc, but thinking back to the autumn, how did you find wearing the accelerometer?

108 - Yeah, apart from the fact that I got a really bad allergic reaction to it, it was absolutely fine. You know. I just I had to move it because it got so itchy, but my skin is like that anyway and I wasn't kind of. Wasn't that surprised. I eventually took the sticky pad off and it was fine, but no, it was absolutely grand. I mean, it didn't bother me. You know it was comfortable in every other respect. And yeah, I was kind of. Obviously I was kind of aware of it being there and I was trying to be as normal as I would normally be, but there was one particular day I was wearing it. It was one of the quietest days we had at work and I was just aware that I was doing an awful lot more walking around the practice than I normally would do when it was quiet and it actually was quite interesting to realize that that's, you know, when you're busy, you're sitting at your desk continuously, but actually when it's quiet you do get up and move around a bit more. Yeah, you take out prescriptions to reception if you know a bit more often and things like that. But yeah, yeah, yeah. My only reprieve is walking the dog in the morning, really. So we have to get moving, but otherwise I think there's some days in practice you would barely even walk 1000 steps if you didn't. If you didn't get up and move apart from work.

EXPLANATION OF RESULTS

R - But looking at those results, and you know, how you behave in general, how do you feel about your overall levels of physical activity?

108 - Yeah, I, I, I do wear just a cheap watch that counts my steps. So I'm normally. I normally will sort of make a big effort to increase my steps if I haven't done many, which is sort of why I know that you know if I do. If I didn't walk the dog every morning, you know my step count would be absolutely dire. And it's the one thing that does sort of keep me more active, I think. I think with less commitment now on my other days, you know I may potentially be able to be more active and I'm very aware that you know not only am I overweight, but I'm in a very sedentary job and I do think there are some weeks where actually it would be far worse and the contrast be a lot different to that, but I think the dog is my saving grace at the moment. Obviously she's wanting cuddles this morning. But yeah, it's interesting. I'm actually I'm kind of surprised I do. You know, as much as I do, but I think it's literally it's. It's because of the dog walking, you know, and that, and I suppose that's highlighted the importance of. You know my routine and getting up every morning to walk the dog before I go to work because you know, if it didn't, I'd be double the size I am now, you know. And yeah, and all the heart disease and all the rest of it with my sedentary lifestyle.

R - So what is holding you back from being more physically active?

108 - I, I mean, I think I think it's a lot of it has been, you know, my commitment to my (family member who was unwell), you know with with her you know. And all the stuff I've been able to do. But I sort of even over the last few months going up to the nursing home when I'm over, I'm taking stuff up there because I haven't been able to to visit, you know, it has been a lot of taking stuff up and then going for a 10,000 step walk. You know with the dog after I've delivered stuff to the nursing home so that I sort of. I kind of start my my Saturday with a with a big walk and and I mean obviously there's been a huge amount to do and. Even just sort of keeping up with all the stuff I do, running our home. And you know, doing all my (relatives) bills and paperwork and everything like that. There's been a lot of sitting around in the in the last. You know, wee while. because yes, it's a complex thing and I suppose you know. And even then you know every time I've been on the phone to her and things like that, you know all that kind of thing you're just sitting on the phone. You know? I mean, whenever she was at home I would have been visiting and. And active, but yeah, I think life is going to change quite a bit. You know, I still think you're not going to have the same commitment to the house, and once we get over or the sort of all the paperwork and stuff over the next few months, you know I think I will get more active and I'm I'm sort of even contemplating the possibility of joining the gym because I'm so I am very aware that I'm really out of shape and you know, my mom and dad both had you know, high cholesterol and high blood pressure and things like that. And you know. And and I've I've been significantly overweight for a while and and. I just can't get my motivation up for it, but I do think you know activity is. Is one of the biggest parts of it. And and I'm just sort of wondering whether I can sort of incorporate something like that into to life to help me to be a bit healthier and. You know and get going, but. Yeah, I think these kind of things as soon as I saw that the the study you were doing, I was interested in it immediately. Because, you know, I kind of know that even just being aware of it, you know you can go for that extra walk, drag the dog around the block at night. You know when when she doesn't really want to go anywhere just to get another. You know another 1300 steps from walking around the block and. I know just knowing that that's that's another little another little achievement, and yes. But yeah, I mean I I do. I've often thought about this sort of standing desk thing as well, I think. You know, I, I think there is a lot to be said for for things like that I don't. I mean, you've probably done a lot of research into it.

R - Well, yeah, I was just going to... because there's some more questions about that further down. But in terms of everything that you have been going through, and I really appreciate you taking the time to speak with me given everything else that's been going on. But you know, with all these other things going on in your life, do you find that physical activity, does that, getting out for a walk and things that, does that help in terms of how you deal with things?

108 - Oh absolutely I think it's. It's it's a, it's a saving grace. You know it's it really is. It's a de-stressor and you know it's absolutely essential. I mean, it's. You know, it really is, because otherwise you just never switch it off, especially when you're in work. For, you know, over 12 hours a day.

R - OK, and looking at work specifically, how do you feel about the amount of time that you spend sitting down during the working day?

108 - It is what it is. You know that there's there's nothing we could do. I mean, we do. We've been doing telephone triage for years, you know, and it is difficult, you know. I mean you, you just can't sort of stand 'cause you're sitting. You know you're on the phone and you know you're tied to the phone and you 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.

R - OK, yeah. And are you... So are you aware of any interventions in the workplace that could help to reduce or interrupt sitting time?

108 - Well, I mean, obviously, you know I've talked to friends, you know some of them have standing desks and stuff you know not not in general practice and and I do wonder whether having something you know I know some people have some sort of, you know, adaptable thing where they can actually elevate their computer so they can stand and work at it. Because at the moment if I stand at all, I'm leaning over and I I can't. I can't type in that position. And I think standing is better than sitting, even if you're not moving an awful lot.

R – OK. Yeah, and if you were, you know how do you think having a standing desk would fit in if you were bringing patients in face to face for consultations?

108 - Well, I suppose it would be the easiest thing would be having something that's adaptable. I think if you I know in principle having sort of thought about it if you're standing patients aren't likely to stay quite as long. And yet you maybe not not get drawn into the same sort of conversations. Maybe that maybe that's a bad thing, I don't know, but. But I think I I'm not sure that patients would be comfortable with the doctor standing there. Yes yes yes. OK, yes, you know it's it's not the same. I think you do. I think you know for better communication you do need to be at the level of your your patients. So I think. You know, maybe if if there was a possibility of of doing something like that. I suppose either either the possibility if you had the space within a practice to have standing workstations where people could maybe stand and do their results and post and letters and things like that, and and have a have a you know using the office for sort of patient communication and stuff like that you know. I mean, I certainly think if we had more space, you know having some sort of you know kind of the hot desk type thing having having a few computer terminals where people could just stand and do a few bits and pieces, you know, while other people use the rooms would actually be a very good use of space. And I think sometimes some of my colleagues work in rooms where they have a bunch of computers and they work with their pharmacists and things like that in those spaces. And there's a lot better. There's maybe a lot better communication within the team, as well, as a result of it.

R - Yeah, that's interesting and are you aware of any initiatives that are aimed encouraging GPs and their patients to be less sedentary and more physically active.

108 - Not specifically, I mean, obviously there's the. There's the the activity, the physical activities schemes that you can refer patients to, but they're fairly strict with their criteria and and virtually every patient I've ever referred to them never completes the course anyway, so you know.

R - Yeah, have you heard of the parkrun practice initiative?

108 – Ah right, the parkrun practice? I've vaguely heard that some people have been involved. I've been... My husband helps with parkrun and we've been involved in parkrun but more more latterly for me before lockdown. It was maybe walking with the tail runner. Yeah no I I I, I certainly know there's been a few practices that have been all involved in parkrun. I think it's a very good, sort of team building.

R - OK. Have you heard of the RCGP active practice Charter?

108 - No

R - No, not many people have. I think it's along the same lines, but the parkrun practice thing I think has been very successful. Certainly getting a lot of people on board.

108 - Yes, well, watch this space as far as parkruns are concerned.

R - Yeah, very good.

108 - Yes, I think I think parkrun is going to open in the next. Maybe in the next six weeks or so.

R - Yeah, no, it's good to see that it's back up and running again. Because I think the community aspect of it is probably as beneficial as just the physical activity thing. You know there's it's. It's more than just just a simple, you know movement, it's there's. There's a lot of other aspects to it that I think really help with a sense of community. And as GP's do you think it's important that we consider our own health choices in terms of our sedentary behaviour and physical activity, in that you know in terms of being role models for patients or how we interact with patients?

108 - Yeah, absolutely, absolutely. I think it can be, you know, I'm I'm kind of aware, you know. Whenever I'm telling a patient that they need to lose weight, you know, I, I kind of would usually self reference and say look, you know I know it's difficult and you know I've I've struggled myself, but it is a case of getting your priorities with regards to to keeping healthy and you know, I mean, I suppose I'm I'm kind of bordering on that sort of BMI of around 30-31, you know. Whereas maybe patients I'm talking to have a BMI of 50, but I I do think it's it's. It's difficult when I am trying to talk about things like that and and aware that you know. I'm I'm significantly overweight myself and I'm telling patients that they need to get their act together. And yeah, I do need to get my act together too.

R - But interestingly, speaking to you know, in some of these other interviews there's. There's also been the perspective that as a GP, it's important that patients can relate to you as well. So if you know if every GP was somebody who is very slim and in perfect health, then patients may not really feel that they're able to be as open and have that relationship with them.

108 - Yeah, true enough, yeah. Yeah, absolutely.

R - OK. Yeah, I thought that was an interesting perspective as well. Yeah, and I think it's valid. So...

108 - Yeah, I kind of see it from both points of view. You know, I kind of think you know it's really difficult, you know, but but also I think I think sometimes sometimes you know coming from my position where I have struggled with my weight does give me a, you know, a a better level to speak to patients on.

R - Yeah. It's just that yeah, but they were the same. Person is also making the same point that you know it's still important not to be doing anything that seemed to be too unhealthy. You know you wouldn't be wanting. It wouldn't be very good if you were dishing out advice about smoking and drinking. If you were, you know, pack of cigarettes in the desk and I bought the whiskey in the corner.

108 - Yeah no, absolutely not. And I mean, I think you know, I I'm I'm motivated to get myself more active and I think you know. And I suppose that probably does come across while I'm speaking to patients too. You know, and I think even even just doing this study you know made me think about it even more, you know, and I would sometimes you know I mean certainly last summer when there were a few times when it wasn't so busy. I've been like, "Right I'm just going to walk down the beach here for for 10 minutes and go down. And I'm sort of like how many steps is that, oh look, I've managed to get another 2000 steps in the middle of my day that's really cool, you know. But there's not many days like that. But I mean, there have been a few comments over time and, if you did have time to take lunch and you're not sitting at your desk eating, you know, would it be better just to go out and have a quick walk and then come back and and eat at your desk so you've actually got off your backside and moved a bit during the day.

R - Yeah, I suppose it's related to workload as well, and that can be quite variable.

108 - But I think it's also good. You know, the odd, the odd chance. Like actually yesterday a few of us, you know. I think that three of the doctors at work. We were having lunch at the same time and it was so nice to actually talk to them. Because so many days and weeks go by where we just never see each other.

R - Yeah, and So what about like walking breaks at lunch time? Do you think if you... would you have time to do that on a typical day?

108 - You know, I, I think in the big scheme of things, if you think about it, even if you took 10 minutes out to do it. You probably would work better as a result of it.

R – Yeah

108 - The only problem is also because you're right in the middle of the community. If they see the doctor out taking a walk they'll think, "Oh they're not that busy," you know, "they've got time to be walking down down the beach every day" You know. I mean, "My goodness , what are they being paid for?" So I don't know, there's that there's that sort of balance sometimes. You know, if I were to be out, I kind of almost don't want to see any of the patients, but you know, it's very unlikely that if you're out in the middle of the day, you're not going to bump into, you know, everyone you bump into is going to be your patient. And even though you might not recognize them, they certainly will recognize you.

R - Yeah, exactly, and then you can't remember their names.

108 – Yeah, especially when you're wearing scrubs!

R - OK yeah, well that's a valid point as well. Yeah, so that's that's all the questions I have for you, but do you have any other questions or comments or anything that you want to check?

108 - No. Not really, no. I mean, obviously I'm just sort of, you know, interested to see you know? I mean, I think you know. On balance it looks like you know most GP's are pretty sedentary. You know when they're at work and and I suppose whenever you whenever you start in medicine, you never think that your job is going to be sitting in front of a computer. And yet that's what it actually turns out to be. You know, when you think about the years working in hospital and you know and how much you were you were just on your feet walking up and down, especially work in the (local general hospital) or somewhere like that where you are regularly doing. You know three or four floors of steps at a time. You're going up and down between A&E and the cardiac ward and things like that. You know, just I mean the level of activity you'd have had in those days was very, very different, and I and I did whenever I went into general practice. Yeah, I kind of I. I sort of vaguely notice the difference, but it didn't really, it crept up on me over the years and you suddenly realise you know how sedentary your life has become.

R - Yeah, I suppose for me it was moving from working in A&E to then working in a job in general practice where I was commuting like an hour and 10 minutes each way and then working in general practice and studying for exams and just doing next to no movement. And compared to what it had been like in hospital was just such a sudden difference. And that's really what got me interested in the area. So yeah, but in kind of looking at things since then so it's kind of snowballed from there, But yeah I'll stop recording here and then we'll just.

Participant 109

R - So thinking back to the study in the autumn then how did you find wearing the accelerometer?

109 - I didn't notice it. It was easy to wear.

R - Yeah, that's good. And do you think your behaviour changed as a result of the accelerometer?

109 - No, I think it was during a very difficult period when I was obviously working full time and studying for my AKT. So I think it was just a period in time that I was very inactive.

EXPLANATION OF RESULTS

R - So yeah, looking at the data, you know, the accelerometer data, do you think that reflects a typical working working week for you?

109 - Working week definitely, maybe now more the fact that gyms are open. I would make my efforts in the morning. I will go to the gym in the morning or I can get maybe a 4 kilometre run in or some weights and stuff. But that's only been since the gyms have opened and I guess for during winter time like 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. So I found lockdown, I really struggled like I would be a very active person, pre lockdown and I really really struggled with activity because I just did not entice me to go out in the cold and the rain. And as well, I was told by a surgeon not to run on my hip because I've got a problem with it, so it was really difficult to get the activity in. And certainly since going from hospital placements to GP, I've noticed the weight gain and the difficulties with that.

R - Yeah, I noticed that big time too, and that's kind of got what got me interested in researching that area, because you know it is such a big difference. And like ST2, I was commuting to, you know I had been in A&E where I was on my feet all the time and then working in in GP, I was commuting about an hour and 10 minutes each way and then sitting down all day and studying for the AKT and it just it really did hit home with me and that's why I wanted to look into it a little bit more.

109 - Yeah no. I definitely agree. I think it's a really good or worthwhile study.

R - And so in general then you know at the moment. How do you feel about your overall levels of physical activity?

109 – Em, if it's not for the fact of me getting up at like 5:50 in the morning, I wouldn't get any.

R – OK.

109 - Like I really have to actively make it part of, you know it's it's not like there's no sort of activity throughout the day that you could have done in any other job. It's just constant. I'm sitting my bum from half eight until half one, eat my lunch at my desk and sit again till six like there's literally no activity in my day at work.

R – OK. Yeah, and in in terms of so, what's stopping you from being being more more active?

109 - During the day at work?

R - Yeah.

109 - Oh, just did the nature of the job. So just at a computer with telephone triage and not having a standing desk like I'd like to have.

R - OK, and this is, I've been saying to everybody I don't want to be patronizing with this question, but it's important to just explore, you know, are you aware of any health risks regarding insufficient levels of physical activity?

109 - Yeah, heart disease, weight, depression. Bad joints, bad posture.

R - OK yeah, I think everybody has a good knowledge of it, yeah? Uh, so yeah, how do you feel about the amount of time that you spend sitting down in work?

109 - No, I hate it like it's very not what I would naturally like to do. Yeah, it's not good.

R - OK and I know you kind of mentioned something there previously, but are you aware of or do you have any interventions in the workplace that could reduce or interrupt sitting time?

109 – None. In fact, you're lucky to get an office. You know it's, particularly as a trainee. You have no say into anything. I know I'm aware you can get standing desks, but that would mean changing structures the whole the whole surgery.

R - OK, yeah, and what about in terms of if you're bringing in people face to face for consultations? Do you do get a chance to kind of get up and walk to the waiting room to bring them in? Or how do you? Or do you use a call screen?

109 - I often get up and walk, but it's you know it's a meter or two meters at most. It's not far.

R - OK. Yeah, because there can be quite a different layout in different practices, so yeah, that's not much then either OK. And, uh. Yeah, and what about? You know, taking breaks during the, for physical activity during the day? Is there any opportunity to to have a walk at lunchtime or at any point in the day?

109 - I don't feel there is at the minute because we're short staffed and for me to get home on time I would tend to take a very quick lunch. 20 minutes if you know. If I had to go to the post office or something like I'd walk. That's happened twice in the year I've been here. Or in my last surgery I would have had a proper lunch hour and would have maybe gone shopping. As in, got

on my feet, grocery shopping and walked about and that kind of thing. But at the minute is not. It's not something I can do in this surgery.

R - OK yeah, and do you ever so you said kind of typically would do your activity in the morning. Do you ever get time or do you have energy to do it in the evening?

109 - I would like. I like to do things like yoga in the evening so I could easily do like an hour. I did that last night, but I would never have the physical or mental energy to do that in the evening. I find it very hard after sitting for so long a period of time to then have energy to do that. I find sitting down very demotivating whereas I easily get up in the morning and do a run or something in the morning if I got that done then I'll do it versus a full day of surgery. You just don't feel fit to, whereas I could maybe do some yoga or something like that.

R - OK, yeah. No, that's interesting. I'm and. Are you aware of any initiatives aimed at encouraging GPs and their patients or general practice staff in general to be less sedentary and more physically active?

109 - I'm not, and it's something I've been very disappointed in (employer). Because I've asked for a cycle to work scheme for a bike and I was told that they don't give offers for its cycle to work scheme. When I first started the service first started working here I asked if I could cycle to work, but I was told because of house calls that wouldn't be possible. So I do think I've tried to, you know, explore those opportunities and it hasn't been an something that's been reciprocated. And I know that there's like parkrun for GP surgeries on Saturdays. That obviously has not happened since covid, but I don't think for me as parkrun on a Saturday is going to outdo the Monday to Friday, you know concerns.

R - OK, yeah, and have you heard of the RCGP active practice charter?

109 - I haven't no.

R – No, OK. Yeah not many people have. And then another question just is, as GPs do you think it's important that we consider our own health choices in terms of our own sedentary behavior and physical activity potentially as being role models for patients and how we interact with patients?

109 - Yeah, completely, you know where it's a fitness fitness to practise issue if you're not getting what you're recommending.

R - Yeah, there's been some other perspectives that come up in these interviews. Also that that sometimes it's it's important that patients can feel that they can relate to the doctor, and if every GP looked like a personal trainer that they may not be as comfortable. You know, in terms of opening up about their own health choices, what do you think about that?

109 - I think that's a bit rubbish. I think we're not, I'm not. I'm certainly not a fitness model, but I certainly feel that we have to be advocates for patients. I think the biggest issue in modern life

at exercise limits would be people saying that there 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 that others that we you know just no matter how busy you are, you can. You can fit something in or prioritise it. It's about priorities.

R - OK, yeah. Yeah, and uh. That's that's all the questions I have there on the the list, but I was wondering if you have any other questions or comments or anything relating to this study?

109 - I guess, eh do you think it's going to make a change for trainees or for GPs in the future? Do you think there's going to be any funding to help with standing desks or anything like that?

R - Em I suppose it's a bit, uh, it's it's tricky because practices do have their own budget and I think there's been other people asking that question. And certainly you know towards the end of the financial year. Practices often seem to have a bit of money leftover that they can or the money comes from the board in terms of making improvements for the practice. And in my practice they bought like a blood pressure monitor for the waiting room. One of those automated blood pressure things, but if you could potentially use some of that money to improve the infrastructure to encourage people to be less sedentary and more physically active in the practice in terms of looking at staff you know across the general practice team, I think there would be a good good argument for that, both in terms of in terms of improving the health of the workers in the practice, but also having a knock on effect in terms of them being more likely to counsel their patients. So I think I think there would be quite a strong argument for that if there was enthusiasm and evidence to kind of support that. Interestingly in the study that we ran, we got 352 responses from GPs in Northern Ireland and 6% of them did have standing desks and among those they had less than 8 hours of sedentary time over the course of the typical working day, which is which is similar to what the trainees working in hospital had and over 2 1/2 hours less than people that didn't have standing desks. So there's certainly a strong argument there now in terms of the. The evidence that they can be effective, so I think I would say watch this space and see. But with the evidence to support it, then there might be more of a stronger argument for it, and certainly an increasing appetite for it. But standing desks don't necessarily have to be expensive either, so a partner in my practice bought one recently which is about 100 pounds. And that's you know, a sit stand desk converter that just sits on top of the normal desk and you know you can leave that just just sitting flat so. People don't necessarily have to stand behind it, either. So yeah, yeah, alternate between the two. But even prior to that I mean in the I I didn't have a standing desk before the pandemic last year and I wasn't that worried. 'cause you're more active if you're bringing patients into the room more often, but with moving to telephone consultations I just used a box of printer paper and another box the same size to put the keyboard and the mouse on and then put the monitor up on a shelf on my wall. So I was able to to stand.

109 - Yeah, I'll, I'll just show you what I'm dealing with here so you can see. But like. You know, I just don't see how that's gonna work.

R - Well, you could. So what you could do is potentially put if you have less stuff on the shelf you could potentially put the monitor...

109 - But I change room every day.

R - Yeah, that's more of a problem. So as a trainee it's very difficult and it would need to be more of the practice investing in sit-stand desks themselves. But what I could do is I can send you a link to a video if you want to try and make a case with your practice. There is a don't know if you've heard a guy called Doctor Gandalf on Twitter, but there's a DP that works over in. Calling him, he's had a standing desk for quite a few years and he he makes quite a strong case for them and then kind of shows how they work in general practice. So potentially he said that on that be helpful, yeah, but you can have a look at and I'll also send on the accelerometer data to you as well so you can have a look at that in your own time as well. But yeah, that's kind of the the you know. Certainly certainly one thing that that can be helpful. Was there anything else you were wanting to know? Just well done? I'll stop recording here, yeah?

Participant 110

R - So when it comes to thinking about the accelerometer, how did you find wearing the accelerometer itself?

110 - It was alright, just taking off the sticky stuff was the main issue.

R - OK yeah, but didn't cause any problems.

110 – No.

R - OK, that's good. And whenever you were wearing the accelerometer do you think you would have changed your behaviour any? Knowing that it was...

110 - Yeah course, of course. you won't find it. It's another factor when doing things like this.

R - OK, OK yeah, I know it's important to bear that in mind. It is interesting. One of my colleagues in the practice was wearing it an accelerator and I definitely noticed that she altered her behaviour as well. That was my own observation

EXPLANATION OF RESULTS

R - So in terms of looking at those results, and in general, how do you feel about your own personal levels of physical activity?

110 – Yeah. At the moment telephone triage is making us all slower and fatter, isn't it? It would be nice to get back to seeing patients face to face on a much more regular basis. I cycle to and from work and home for lunch. I like cycling so that it can balance off the sitting down with exercise. I've got five small kids at home so the opportunities for getting decent quality exercise are few and far between, but... I try and do the high intensity stuff for an hour and then get back to normal life. I used to use a fitbit, but then I sort of got fed up with it. An interesting one... one of the ST3s did a QI study on trying to improve joy in the workplace. So she'd initiated a step challenge as part of that so. So within a practice step challenge to see who could get the most number of steps in a day. But I did that for a while. I was thoroughly depressed because I was very very low. I think it's cause it counted on the phone rather than a watch so it probably doesn't pick up the movement as well on a phone.

R - Yeah yeah, OK, very good and this this I'm trying not to be too patronizing with this question, but it's just important to explore like you know, are you aware of the health risks regarding lacking physical activity?

110 - Yeah, yeah, absolutely.

R - What sort of things you know can it lead to?

110 – Eating too much chocolate. Yeah, atherosclerosis, overweightness, diabetes, more chocolate, low mood. And other chronic health conditions. And yeah, increased wear and tear basically.

R - OK yeah very good and yeah, so specifically thinking about work. You know how do you feel about the amount of time that you spend sitting down during the working day?

It's appalling. Whenever I have patients in, and they're complaining about being unfit I lament and agree with them saying I spend all day sitting down and I have to work extra hard, whenever I'm not sitting down to try and stay active and stay fit. I tried the standing desk. It's OK. But I have a 34 inch monitor so it really makes it very top heavy. Also I've a forearm problem which means I need my right arm supported on a flat surface. Yeah, every so often I think about going down to IKEA and buying an electronic desk, but I think we need to work with what we have and try and build in exercise by cycling to and from work.

R - OK, Yep, and yeah, apart from standing desks, are you aware of any other interventions that you could do during the working day to reduce or interrupt your sitting time?

110 - Get one of those little pedal things that go under the desk you can pedal. I think frequent breaks. Bringing things to and from the office, from the admin side of things so I can go for a walk a couple of times per hour. Bringing papers to the admin stuff and collecting things rather than relying on other people to do the walking for me. No journey wasted. Anytime I go out I have a bit of paper in my hand.

R - And if you were, you know, pre pandemic, whenever everything was face to face, would you have walked to the waiting room to greet patients? Or would you have called them in with like a intercom system or call screen?

110 - Yeah, we'd have used the intercom. It's a wee bit more efficient. It's all about cutting down times and transit times in this place. We use lean workings and QI to make the turn around as quick as possible and using the intercom makes it quicker in that regard. If I wasn't in the room which is the furthest from the waiting room I might consider that. I could stick my head out the door and shout, and I think the human touch is very good, but yeah, by the time I walk to the waiting room and walk back again it takes too long.

R - Yes. Yep, Yep, that's that's interesting, yeah. Are you aware of any initiatives for encouraging GPs and their patients to be less sedentary and more physically active?

110 - Yes, that was one of the ones that our trainee did, the QI project. As part of a broader improving staff morale thing. The other one was a bakeoff type thing that each of the team bakes cakes on a weekly basis. That probably had a negative effect. So cakes, exercise, yeah. Not aware of anything else, no.

R - Have you heard of the parkrun practice scheme?

110 – Oh yes, we are a parkrun practice. Sorry, yes we are a parkrun practice. (Another partner) I was very keen on that, so we have to be... Pre-pandemic we were doing parkruns.

R - OK yeah very good. Have you heard of the RCGP active practice Charter?

110 -No no.

R - OK yeah, that's another one as well. Yeah, but it's not. Doesn't seem that well known. Yes, interesting just exploring that. So yeah, a final question really. Is, you know, as a as a GP, do you think it's important that as GPs that we consider our own health choices in terms of our sedentary behavior and physical activity? In terms of our role as role models for patients and how we interact with patients?

110 – Well yes, I can't really tell the patient off for being overweight and unfit if I'm overweight and unfit myself. I usually, I don't know if you can see in the corner of my office is where I clip my bike. So when I cycle to work I leave my bike parked in the office so I can turn to patient and say "get a bike," and point out that I am not being hypocritical. Being genuine in the message we are trying to sell to our patients is very important.

R - Yeah, yeah, I know very good and I suppose it's important to bear in mind in this study that you know people that replied to the questionnaire and wanted to participate, or probably more likely to...

110 - Yeah, yeah. Selection bias.

R - But even with that, we've still seen that the sedentary behavior you know time spent sitting is very high regardless, which is which is, which is interesting. So in in general, do you have any reflections or questions related to this study or anything else that you want to ask about?

What accelerometer. What's that saying? What was a little bit longer? Measuring this is just an accelerometer measuring movement, or is like a major skin building just myself or at its its accelerometer. Yeah, so it's a technology that a lot of people have on their phone that tells the full screen whether it needs to be upright or or that you know of horizontal? Yeah, then there's there's algorithms and things that you can plug the data into to then work on exactly how much time was spent. Step count and setting time standing time. Which is all quite complicated, which is why it took awhile to get it back. But now that we have it, yeah, we're running it up into Interstudy now. So yeah, I'll, I'll send you through the email with your own personalized data that you have for your own reference and log in. Discover that. I'll stop recording here.

Participant 111

R - So how did you find wearing the accelerometer?

111 - Fine, yeah it didn't really bother me to be honest.

R - Did you find it was banging off anything or into something?

111- Though to be honest, no like you were kind of your sort of aware of it at times. I think probably one leg did you?

R - I think we said to wear it on the right thigh potentially.

111 - But yeah, I think if you kind of rolled over at night. You kind of notice that a little bit, but apart from that, no, it was fine.

R – Do you think you changed your behaviour as a result of having it on your leg?

111 - Yeah, probably. Probably there's probably a motivator to do a little bit more. You know, we try and be active anyway, but probably a little bit more than normal. No, but yeah, not kind of anything too dramatically different.

R - If you want I can share my screen and then we can have a look at your data for the accelerometer study in an Excel spreadsheet. Then I can talk you through it. Yeah, so can you see this OK? Y

111- Yeah.

EXPLANATION OF RESULTS

R - How do you feel about that in terms of thinking about the physical activity? That's like, you know, whenever you're moving and being active. How do you feel about your overall levels of physical activity?

111 - Like throughout a week? Do you mean in general or based on that?

R - In general and kind of based on that as well.

111 – Regarding my own activity levels, yeah, I'm aware that I do not have... I very rarely achieve the 150 minutes that I'm supposed to be getting. So I'm a lot less active than I would like to be. I'm aware that I certainly notice with changes in the pandemic that work is less active. I used to always walk to the waiting room to call the patient, you know, to bring them in. Now we're sitting at the desk on the phone so work is a lot less active. And, something else I would say, yeah, just time pressures get in the way of doing as much exercise as I would like to do. Looking at the data it is quite surprising you know the difference (between a workday and a non-workday) and what I was thinking was... I'm probably a fairly active person, and I suspect that you may have recruited people who are interested in this area or more likely to sign up to

do it so that actually may represent, you know, above average active people like a few other population, but even, despite that, on a workday, we're only getting half the number of steps that generally we should be doing. It's interesting, interesting to see it. You know the actual run of it.

R - But actually, you know, in terms of the physical activity there on a non-workday you were getting in terms of moderate to vigorous physical activity, you were getting 78 minutes which is, you know that's over an hour and fifteen minutes. Yeah, so actually if you think if you have two days a week that are non-workdays, then you are actually achieving your 150 minutes so. Just on those days you know you're achieving your what's recommended across the course of a week?

111 - Yeah, you're just having to cram them into a couple of days. Yeah, yeah, I know. I know you sort of wonder how sustainable it is too. Because it's not really sustainable for me to kind of do 75 minutes, two days a week. You know, that may have been, maybe a slight over representation of my normal week.

R - And so, in general, without being too patronizing but are you aware of any sort of health risks regarding levels of physical activity from not having sufficient physical activity?

111 - Yeah, I think it's pretty much. Almost every condition is made worse by lack physical activity, so, but obviously particularly cardiovascular risk and metabolic syndrome and diabetes. But then even things like mental health problems, depression, anxiety, and so on. Any chronic disease really is. You're increasing your risk by a lack of physical activity. And I remember reading a thing that said that physical inactivity is a bigger risk factor for cardiovascular disease than obesity. So basically you're putting yourself at higher risk by sort of being thin and inactive than being overweight and inactive. Yeah, you know that's I think yeah.

R - I think a lot of us are aware of, you know physical activity and the problems with not being physically active. It's just actually acting that out in our lives is the difficulty. So specifically then, you know, talking about sedentary behaviour, like time spent sitting down, how do you feel about the amount of time you spend sitting down when you're in work?

111 - It is more than I, based on the accelerometer, it's more than I obviously realised. So, working day I did, I estimate 8 hours and it was actually 11, right? I mean, that's an awful lot more than I thought. How do I feel about it? Yeah, I don't like it. I would like to do something about it. And I think, you know, obviously for general health reasons it would be nice to be more active, but I think generally feel better at the end of the day if you have been more active. I don't know how you feel, but I find, you know that these pandemic days where you're sitting at a desk all day and not moving. You feel, I think I think more mentally drained, whereas before you know, we were certainly more active and even, you know, when your patients are in the room, you're probably more, even doing kind of sitting movements. You know you're kind of, you know, turning to the patient, getting them on the couch to examine. There's just a little

bit more movement than just on the phone. So it certainly frustrates me and I think it often feel lower morale at the end of the day having a less active job.

R - That's what I noticed, that's what got me researching this area so it's interesting that you think that as well. So, in particular, you know, what's stopping you from being less sedentary? You know, spending less time sitting during the working day?

111 - I think it's just the workload. It's all computer based. It's all sitting at the table and you've got this long list of phone calls and you know if you go... I often bring air pods into work and intend to go for a walk for 15 minutes at lunchtime or 20 minutes, but sometimes the workload is so heavy that you think, well, if I go for a walk for 20 minutes at lunchtime, I'm going to be staying 20 minutes later at work. I would rather get home and see the kids and then I could see the kids and then I'll go do some exercise after they're in bed and you feel less inclined at eight o'clock at night to do that. So it's yeah, it's the workload to be honest. And then you know in general practice there's always, kind of, efficiency. You try to be more and more efficient, so you know, I could probably bring all the prescriptions down to reception four times a day. But you know, you think I could save myself a few minutes if I just do it twice a day and little things like that. Yeah, I hear some GPs, and I suppose I'm tempted now, bring a flask and have a cup of tea at your desk rather than having to walk down to the kitchen and waste 5 minutes doing that you know it's just, it's just the time pressure, isn't it?

R - Yeah, I think that will be a theme that will come up a lot in these interviews. Are you aware of or do you have any interventions yourself that could reduce or interrupt sitting time? Is there anything you can think of that might help you to do that?

111 - The standing desk is it is certainly something. I actually ordered one a couple of weeks ago after seeing on Twitter your, I think someone had retweeted your talk about reducing sedentary behaviour. So I ordered one and then it arrived and I thought I'm never going to use this and I sent it back again. So now that it's been highlighted that I am even less active in work, then I realised I may well order it again. So that's why yes and standing desks seems to be something that would improve my activity levels. Certainly talking to people they would say that they feel physically very tired at the end of the day having used one. I think I would feel happier feeling more physically tired at the end of the day. I have a Garmin that counts my steps, although I don't really pay an awful lot of attention to the number of steps. But on the days when you when I do look at it, you realise that the at the end of the day you walked very little and actually that was, that was the emphasis for me changing, this is pre pandemic, changing to walk to the waiting room, to collect the patient or call the patients every time and I did find that I could increase my steps by couple 1000 a day by doing that. I've heard of some practices where they have they have had a Qi project, one of the GPST3 trainees, did a Qi project where they got all the practice members to download an app where you could record the number of steps that you did and it was shared in the group and then whoever had the most number of steps at the end of the week got a prize. You know, then you would have had

staff members going out for walks at lunch time to get their steps up. You know, that seems like a good project and I think the other thing was the parkrun. This all played out pre-pandemic, but, you know, practice parkrun. So we signed up as a practice parkrun and we'd intended to do our local parkrun, you know, get all the receptionists to come along, everybody would run it or we would volunteer. Unfortunately that never happened but I think I think parkrun, they can also do a talk you know, I don't think someone comes but, you can sign up to a talk to kind of motivate the practice, and I've often thought that that would be a good thing and probably something as a partner I should do to try and encourage the physical activity of staff in the practice. Yeah, I think it's about it.

R - Have you heard of the RCGP Active Practice charter?

111 - No, I haven't.

R - That's another thing that's about practices trying to look at being more physically active, and that's something you might want to look at as well. Yeah, I can share that with you if you want afterwards as well, but yeah, it's not that well publicized typically. So that's interesting that you bought a standing desk and then sent it back. What made you think that you wouldn't be able to use it?

111 - Well my, 'cause I work part time then my up my room is shared and I thought. I thought whether whoever is using my room probably would not appreciate, they might not appreciate it being there or, it's not something that's ever been talked about at our practice, and I think probably there would be a bit of. What is this? You know, 'cause I say I'm always buying you stuff for the room. So 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. Yeah, it probably is practice culture you can put it down as the reason.

R - And do you think if the other partners were interested or receptive to it. Well, do you think they would be interested in something like that?

111 - No, no, they really wouldn't. Yeah, they really wouldn't, and I think even if I had one and was extolling its benefits, I still I don't think that they would change, but maybe they would. The practice manager might, but I would be very surprised if they did.

R - Yeah, this is an anonymised by the way. Nothing is traceable back to anybody. Yeah, and but if you worked in a environment where you know the other partners in practice manager and everybody in the practice had standing desks and used them, do you think you would be much keener?

111 - Yeah, I think it's probably being the first person to take the step. Whereas if someone else had I would have, yeah, I would have had no qualms about putting it up.

R - Do you think if you got feedback, you know, if you did have a sit-stand desk and if you got feedback on how much time you were using. You know sitting or standing behind it. Do you think that would be something that would interest you?

111 - What do you mean sorry?

R - How much if, if, if you're if you had, if there was a way of finding out how much you were using the, you know, say you had the accelerometer on your leg to tell you how much you were using the, you know, how much you were sitting and standing. You know over the course of the day that would help?

111 - Yeah, I think so. I am quite responsive to data. I think probably more so than how I feel about it, you know. So if you, kind of, you get the hard numbers. Definitely that would be a big motivator.

R - Yeah, and in terms of you know, being a GP. Do you think it's important that we do consider our own health choices in terms of, like you know, physical activity and things like that? You know, in terms of being role models for patients, and how we interact with patients?

111 - Yeah I do. And I think you know my own personal interest. Kind of probably waxes and wanes a little bit. I did, I know you've done the Masters in sports medicine, I did the diploma in it. It was massively motivating for me to kind of improve my physical activity and then kind of pass that on to patients. You know, and it's certainly my own interest, and it certainly spilled over to patients, so I was writing out exercise programs for fibromyalgia patients. I would encourage them to go along to the local parkrun because I had found it helpful myself and I think like I never struggled with my weight, but I haven't always been very fit, so. I think giving personal stories could be helpful as well. I have a, I have a bicuspid aortic valve, which kind of slightly limits how much I can do a little bit, but sometimes I think. I don't use it as a guilt trip but occasionally patients would say I can't exercise because of something like that and I kind of think, well, if I sort of explained from my perspective but you know, I know the benefits outweigh the risks in certain circumstances. That can be motivator for patients, whereas I think if I had a very negative take on it, or consider it less important, then that would come across in the consultation. So I think in terms of health promotion, I think it's really important. I think if you were, if you were very overweight and seemed very unhealthy, it is like, patients don't respond as well to that if you're telling if you're recommending they lose weight or become more active, I think it is probably harder to get that from somebody who clearly doesn't practice with they preach.

R - If and if you did have a standing desk, do you think you would use it to stand up behind whenever patients were in the room with you? Or do you think you would put it more in a seated position if they were in having a face to face consultation?

111 - Yeah my thought had been for all the telephone consultations have it standing and when the patient comes in to be sitting. I think most consultations are better done sitting. When I first

started General Practice I really pined for the A&E days where you were standing and I think I found that the A&E consultations were quicker. Possibly, this is not a good thing, but I think I slightly preferred the more doctor centred role of being the standing A&E doctor and walking into the patient who is sitting down and lying down and probably feel like you got more control over that consultation because you can get up and leave and come back. You know. Whereas if you're sitting and they come to you, you're almost waiting for them to stand up and leave. It's out of your control. I don't feel that anymore. I think I probably have more experience ending consultations and encouraging the patient out of the room. But yeah, I didn't like it at the start of General Practice sitting down rather than standing. There would be there would be some patients that you know that I suppose, people with shoulder or knee problems, probably more, maybe more MSK problems. You've done the history over the phone and they come in and you're going to examine them. You could do that consultation standing, but, I think patients are so used to having a sitting down doctor that if you're standing up they might be study less likely to volunteer an extra problem. Just because of that, kind of, if they're standing, it's less of a kind of a comfortable environment that would be conducive to. You know, adding in the extra little problem that there may be, a wee bit nervous about bringing up.

R - OK, yeah, that's good to know as well. And yeah, I think I think that's all the questions, you know, from the list that I had there. But is there anything in particular you wanted to ask about it? Or you wanted to explore more?

No, I don't think so. But it's interesting to think about it, and it's definitely motivation to, actually go for the standing desk, you know. I think it probably will reorder it. It would be good if there was funding for these sorts of things, maybe maybe it could be used in. Maybe we could put some of the money we got from the board towards these sorts of things. You can get a new couch or improve your whatever stuff you have in your room. And I don't know if a standing desk is seen as an item of equipment, but it's usually fairly vague and I probably would be something that could be... It was kind of advertised as a way, you know, we got this grant recently for improving infection control. It was obviously important during the pandemic, so you know you get wipeable chairs and wipeable curtains, whatever, blinds and things. But as you say about the health of the GP. It's not a huge amount of money, you know, if you get a standing desk for £80 and it's offered to practices. It would be a good thing, wouldn't it? Maybe your research will highlight the need for that?

R - We'll see. Yeah, we'll see what happens.

Participant 112

R - So I know it was kind of affected by the covid pandemic, particularly with yourself. But how did you find wearing the accelerometer whenever you did have it on?

112 – No problem.

R - And do you think whenever you were wearing it that you would have changed your behaviour at all as a result of knowing that it was picking up your movement?

112- I'm gonna say I'm gonna say no with it because already we're all obsessed with doing the steps recorded on your iPhone. So I mean, I think a lot of us were already so it didn't wouldn't have changed my behavior. No, no.

R - OK. So, uh, but you would normally record your steps then.

112 - Well, yes, once I discovered an iPhone could do such a thing, not that I. You see you'll think I grew up in the ark, you know? Luckily I have boys who are about your age and they keep you on top of technology. Yes, so would, well you know. I mean I walk a lot just you know because we have a dog. You know there's no doubt counting the steps does give you a little bit of I hope I I would like to think I'm too mature to be target obsessed, but you know, you do look at and think oh that wasn't a bad day, you know so it does motivate you without a doubt.

R - And it's similar technology in the accelerometers. You know, those devices, as in phones, but it's just what's nice about the accelerometer is that it's blinded so people can't see what it's recording, so they really then it shouldn't change their behaviour quite as much, but there is the what they call the Hawthorne effect where people change their behaviour when they know they're being observed. So it's interesting just to check with people.

112- Every intervention is an intervention, basically isn't that right?

EXPLANATION OF RESULTS

R - But on a day off you were very, very active, which was certainly very interesting.

112 - I think I'm at the end of the work day. I just come home, make the dinner, and then collapse. I'm sure, that's age related.

R – Although it's a theme that's been kind of coming up across the board how it differs on a work day. Yeah, so you know it is certainly interesting. Yeah, uh, and I'll send you through those results afterwards here that you can have a look at in your own time as well. But overall looking at those results and in general, how do you feel about your levels of physical activity?

112 - I would say over lockdown like everybody else, you know people gone one of two ways, either less or more active you know, and I've definitely become much more active because there's a lot less time to do anything other than, you couldn't do anything other than walk. So

we do have a big dog and we just walk her two or three times a day on the days that I'm not at work. But on the days that I am at work, awh, like I just know I just get in after 10 hours... do you know it's almost more the mental fatigue in the physical fatigue, you know, you just get and you're just... (exhausted sound) like. So I yeah, no, I I definitely feel I've become more active. In the last year, certainly lost weight in the last year, you know last about a stones and a half not because I've been trying but I think it's just because I've been physically more active yeah. So maybe maybe I needed to. I think you're more likely to lose it if you need to lose it aren't you. You've got more to lose.

R - Uh, do you think that those changes being more active will persist now that restrictions are coming to an end?

112 - Yes, I say that maybe maybe that's naive, but I think so, yeah. I mean I hope so, yeah, the dogs not gonna go away. For years, but yes, yeah, we really enjoyed walking. Also I maybe I did. I don't know what your age range of participants was, but. I don't have small, I'm sure you've worked that out. I mean my you know children who in their 20s you know, so I don't have a child. You know I can come home and do what I want. My days off are mine. You know to you know not so I definitely will keep up the activity. You know I've always enjoyed walking, so yeah.

R – No, we've got a good mix of different backgrounds of participants. You know, age ranges and working levels and things which is helpful because we want the variety, you get the best results. So, this is a question I don't want to be patronizing with this question, but I've been asking everybody just in general. Are you aware of any health risks regarding insufficient levels of physical activity?

112 - Do you mean across my own personal or across the theme?

R - Just in general? You know what are you aware of? Any health conditions or problems that are related to not being sufficiently active?

112 - Yeah, yeah, so. Well obviously the biggest one, not just to do with activity, but probably largely to do with activity are obesity, hypertension, cardiovascular risk, type 2 diabetes and link to all of those. Then cancer as well. So yeah, I mean the biggest, probably the biggest thread is probably obesity and then cardiovascular and type 2 diabetes.

R - Yeah, OK, and kind of looking at the results of your sedentary time, you know, you were spending over 11 hours of sitting on each work day. How do you feel about the amount of time you spend sitting down in work and on a work day?

112 - Yeah. I mean, I accept it that it's part of it. I don't know what else you can do about that in work. I I you look like you're standing now, so maybe that's what you do in work you just stand the whole time. You know, some people maybe do do that and there might be something in that. But you know, most workstations are still seated. You know you, you know you need

things at the right height for you to stand, but. I mean, it is what it is. I'm sure actually probably 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 like 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 have booked in, so there's very little opportunity for activity at all in the workplace. But that I I don't know how you change that. I mean, I think that's the same. Probably the only people who are active, professionally, who are active in the workplace are teachers. I'd imagine they would be on their feet a lot and walking around, you know. But even my daughter's a teacher and she would have said during lockdown teaching from home, you know you are just sitting in front of computer.

R - And can you think of any interventions that could help to reduce or interrupt sitting time? Like in the workplace?

112 - You know, I. If you think about general practice specifically, I mean, it really comes down to workload. I think you know if you think you have time to step away and go for a walk but nobody does. You don't have the time to do that. You know, you find yourself absolutely. I know some of our reception staff have moved their seats away and would just try and stand. They would put their headsets on and just speak from a distance but I think it's probably not that easy. You know to change that physical sort of set up, you know where you just are sitting in front of the computer the whole time on the telephone. You know it's a call centre isn't it really. That's what we've become, call centres really. Em, you have to build breaks in where people were, you know. Actually, I don't know if you know our surgery, but I mean it's it's. It's in quite a nice location. It wouldn't be hard to get out and go for a walk in a pleasant area and come back in but you wouldn't have time, you never have time to do it.

R - Yeah, yeah, no, that's a common theme that that has been coming up and. OK and yeah, have you have you heard of anybody using standing desks in general practice?

112 - Yeah, no not in general practice, but I also work in the trust and some of the admin staff and so I, you'll have heard of it, you have an equivalent thing in the (R's health health trust) but in the (different health trust) it's called the Acute Care at Home team. And some of the admin staff who are based in (hospital site) have got standing desks. You know, I've seen. I've seen them. Now I, I couldn't stand all day I I had a back problem years ago and I just couldn't do it. You know I find standing for long periods of time much worse than sitting actually oddly. So I stood at pitch sides for years watching cricket and rugby and this, that and the other and standing wouldn't you know I couldn't do it. But I know, I know I've seen people do it and sometimes when they're standing they're going from foot to foot to try and increase their steps. But I mean all seems a bit artificial.

R - OK, yeah. No, that's interesting. Are you aware of any initiatives that are aimed at encouraging GPs and their patients to be less sedentary and more physically active?

112 – Not for GPs. I know we can refer patients for activity courses to the local health centres but I don't know of anything for staff.

R - Yeah, have you heard of the parkrun practice initiative?

112 – Oh, actually, that is. Yes, I do know it, I think. We're actually signed up for it. Of course it stopped during lockdown, but yes, one of our partners did sign the practice up for the parkrun yeah, but I don't do it. I can't run. I just physically get a sore back when I run so. Yes, yes. Some of the partners did do it, but not consistently. You know, it's I think it looks like they just find it hard I think to make the time to do it. I guess it's not that you want to be too obsessed about these things, but, and the parkrun is a great idea, but if you work hard and you don't have a huge amount of time during the week with your family, I don't think that necessarily at the weekend you'll want to be saying, "I'm off to do things with my work partners." I get, you know, even if it wouldn't be for me, I wouldn't do it. You know, weekend is family time, you know. So for whatever that looks like and I'm kind of past that stage, now. But I know when my kids were young, I spent every minute I had with them because I just spent too much time at work, basically.

R - OK, and have you heard of the RCGP active practice charter?

R - No no. Had anybody heard of that? No I haven't. Having said that the girl. The partner who signed the practice up for the parkrun is also the RCGP link, but she has been off for maternity leave for a year, so. Possibly it would've been something that would have existed in our mind had she been around. But no I haven't heard of it.

R - OK, and in general then as GP's do you think it's important that we consider our own health choices in terms of sedentary behaviour and physical activity in considering our potentially being role models for patients or how we interact with patients?

112 - I mean it's the old, you know, don't do as I do, do as I say. You can't be all things the all men. I'm not sure I I. It's obviously important to be as fit and healthy as you can be, but I don't necessarily subscribe to the idea that just because you don't do it doesn't mean you can't talk about it, encourage it, and have a view on it, you know. So I don't necessarily subscribe to the view that just because you have no unders... you know you have no personal experience of a thing that you can't... all of medicine you know, we don't have a personal experience of the vast majority of what we deal with with patients. I do not have a personal experience of someone in my household being suicidal. And yet I talk at length all day, every day. To hundreds of patients about that. So I think it's not a bad idea, but people will do what they do. You know it's you know, I think it's good to encourage them, but I don't think they would be... I would like to think patients wouldn't come in to me and think, "well you don't look like you do much so therefore I'm not going to bother!" That's not really what happens. You know? Who knows? I know that, interestingly, you probably know this, but the first long term studies linking smoking to lung cancer were the doctors health studies, which I think were done back in the 1950s, I think they

actually were done. Studies were carried out on doctors across the piece, not the general public, so we probably do probably do need to try to lead the way, but I don't know people. People will do what they do. Basically, you know.

R - Yep no, that's interesting. I've there is. There's been some other people having similar thoughts as well, which is, which is very valid I think. So no, it's very useful. And yeah, that's all the questions that I have in the list there. But do you have any questions or comments or anything relating to the study?

112 - But I think it's been a very interesting. I think it's a great idea, I think actually. I think probably one of the things we were not good at. Doctors are particularly not good at this. We're not really good at making an estimate of ourselves, so when it comes to exercise, I don't know how close. I obviously didn't wear the thing enough, but. You know, I don't know how close people's estimate of how much activity you do compared to what they actually do. You know, I think we're not particularly good at you know. I think we think we probably do something quite different to what we actually do. You know, I think where that people who go onto diets and sort of, this is how weight watchers and all works. You notice the fact that you actually. If you actually record everything that goes through your mouth. If you asked people how much you think you actually eat each day you know then they will say whatever, whatever, whatever. But if you if you actually filmed them or you know if you get some way of actually recording, everything went through the mouth, most people are like, I didn't realise, I forgot about that and I didn't add in that. You know, we're not really good. I think I don't think people, humans, doctors in particular you know are particularly good at estimating. So something like this where actually records in real time what you are actually doing is a really interesting study, and you know, just physical activity is so good for every aspect of your health, your emotional health, physical health, psychological wellbeing, just getting outside and switching off. I think that's probably one thing I have had to learn to do. This is not to do with the study, but you should learn to do it as well. When you're not at work, do not be thinking about work. You have got to be able to park it. People don't. You know, people waking up in the night in a cold sweat, you know? You've got to be able to. You will not be able to do the job for 30 or 40 years if you can't, leave it behind and you know have a separate life. You know it's it cannot become all of you, but all of that is included in this whole idea I think of more sort of general wellbeing. I think it's probably you know there's no occupational health for GPs. It doesn't exist, so there's occupational health in hospital, I don't know whether doctors ever use it, but there's really no occupational health for GPs. If you're really having a problem. And or, you know, there's nowhere to go. You have to try and find a sympathetic friend. You know, there's nowhere to go with it at all, you know so. Not hat that's a confession. I don't feel I need to, but. But if somebody did. And I would like to think a friend or colleague could come to me, but in reality I don't know what happens with most GPS who find themselves, you know, in difficulty. I don't think there's much out there for them so. Anyway.

R - Actually, something that came up is there's a team in Loughborough. They're quite big in Loughborough University are quite into their sports medicine and exercise research, so we're now collaborating with them with with some other participants getting them to wear accelerometers and also asking them about their wellness. You know, their like physical health and mental health and burnout and fatigue and things to see if there's any correlation with with that and their physical activity. So it is something that we're looking at a bit more detail moving forward, so it's actually. Kind of going on at the moment, so there's plenty to keep us occupied.

112 - Excellent you're heading down the foundation for lifelong research work so good for you.

R – We'll see. But no, it's it's certainly been some some interesting findings anyway. And actually what you were saying about the self estimating thing we find with the accelerometer study that people were very good at their working day, estimating their work day sedentary time. It was only underestimated by I think it was last in 15 minutes and typically people underestimate it. Much more, you know, across the general population. But I think what was so good about the working day estimation is it's especially in GP. It's very routine and structured. I see you, you know you do the same thing pretty much every day. You're in general practice in terms of size. And yes, yeah that's right. Yeah, whereas on the day off work then it was underestimated by I think about 3 hours. 'cause you know if you're on the weekend or off work then it's very variable. What you'll need to do? Yeah, it's much harder to kind of predict. Yeah, well, that's interesting. That is interesting, yeah, but yeah, in terms of the study, I'll stop recording there.

Participant 113

R - So thinking back to the accelerometer study in the autumn, how did you find wearing it?

113 - It was very straightforward. There were no problems that I encountered. The device strapped to the leg, I forgot I was wearing it most of the time. Yeah, I. I did make a point of. Recording every day. My step are at my my expected activity level I and that wasn't really much of a hardship at all.

R - OK, yeah, so you had like a pedometer or something? Did you as well?

113 - Well my phone would record at least nominally my steps, but I've a Fitbit or an Apple Watch or anything like that.

R - OK, yeah, it'll be interesting to see how it compares then. Because it does calculate a step count and. Do you think you changed your behaviour as a result of wearing the accelerometer?

113 - Initially, I think I did and then as life got a bit more complicated, exams and portfolio requirements started kicking in again. I think I've just slipped back into old habits. Very easy to just get into a car drive for an hour, sit all day drive for an hour back and then go and sit at home after a long hard day. Too easy.

R - But I mean in terms of the week you were wearing the accelerometer, do you think you changed your behaviour as a result?

113 – No.

R – That was fairly reflective of a typical week for you.

113 – Yes.

EXPLANATION OF RESULTS

R - But interestingly, you had for you'd a very high step count on the accelerometer, so I don't know whether it was just small movements and things during the during the day, but it recorded 9500 on a workday and then on a day off work it was averaging over 10,000 which is pretty good.

113 - Generally I would walk, I would make a point at least four or five times during the morning of getting up and walking away from my desk to reception, but I would struggle to see where nine and a half thousand was coming from unless I have been also going for walks in the evenings. Em, because we had the weather was a bit better at that stage, so we maybe had been going out for small walks in the in the evening. But the practice practice isn't that big.

R - I know I was eh, it was certainly yours is one of the higher ones, but you can see that the overall average in terms of work day was about 5000 and something and a day off work was nearly 11,000. But yeah, yours is more similar.

113 - I did forget that I was wearing it, so say if I sat and I shook my leg, because I have a terrible habit of doing that. Would that, maybe record that as steps?

R – It could, it could. Yeah what the confusing thing is. Yeah the 'cause it says there normally you would see that if you were having a lot of steps that would go into the moderate to vigorous physical activity section, but that was quite low. So yeah, it may well be just the way the accelerometer picks it up. If you shook your leg that might have impacted all this, but yeah they generally. I mean accelerometers are the gold standard for that sort of research, so they are validated for that sort of thing, but it may have been an influencing factor. But yeah, I'll send you through those results for you to have look at. But looking at those results and in general, how do you feel about your overall levels of physical activity?

113 – It's poor and I know it's poor. It's probably not not helped by two hours in the car most days and there not being a set lunch break at my work. When I was in my previous practice, I sometimes would have gone out for even a 15-20 minute walk. There was a small walkway by the practice I was working at. So sometimes would have done that just to clear the head but there's not really the same opportunities to do that in my current workplace.

R - Yeah, is is what what is that just the local infrastructure you mean like outside the practice?

113 - It wouldn't be the most appealing place to go for a walk whereas the country practice I was in before had a dedicated Eco-garden and walkway which was quite pleasant and I suppose that my work day is 9 to 5 which really does, especially with needing to see 30 plus patients does quite constrict the amount of time that you can afford to spend away from your desk. And so that would definitely be a factor as well in terms of just getting out, you know, just getting away from the desk to to do a walk.

R - Yeah, OK, and this is, I'm telling everybody I don't be patronizing with this question, but I'm just asking everybody this in general. Are you aware of any health risks regarding insufficient levels of physical activity?

113 - Well, absolutely.

R - And can you kind of name some things that would come to mind?

113 - Absolutely, obesity deconditioning varicose veins increase risk of clots heart disease worsening of existing health conditions like asthma which I have. Em, poor mental health, em, gosh osteoarthritis. osteoporosis.

R - Yeah, that's fine I'll stop you there. That's plenty. But yeah, everybody's been saying everybody. I think there's certainly good awareness of it. And how do you feel about the amount of time you spend sitting down in work specifically?

113 - It's it's too. It's too much, but again, with the physical layout of my workplace, there wouldn't really be the option for a standing desk like you would have in the hospitals. I mean in (the local district general hospital), certainly most of the computers are standing desks. Whether it's in emergency departments or in the wards, and that's probably because of lack of space than anything else really, but em, you know that there's a fixed fixed desk and into the into the wall, which doesn't, you know, go up or down, and so there's not really the option to do something like a standing desk at work.

R - Yeah, is that. Do you mean is there not enough clearance for a desk to kind of rise up and down because there are standing desk converters that go on top of a normal level desk?

113 - I think that the practice would be quite reticent to invest in even something as menial as a as a converter.

R - OK, yeah? Because they're only 100 quid actually? But yeah, that's interesting and. Uhm yeah. And apart from you know, standing desks as you mentioned, are you aware of or do you have any workplace interventions that could reduce or interrupt setting time?

113 - I just make sure so I 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 every at least every 10 patients as well and so we don't have anything else in the practice that would really facilitate more more mobility during the day or less sedentary behaviour may be more accurate to say.

R - And in terms of yeah, I suppose now a lot of the conversations are happening remotely. But now I mean and prior to the pandemic. Would you have called patients into the consulting room? Would you have gone to greet them in the waiting room or would you have used an intercom or call screen?

113 - We have EMIS so you press the button and it flashes up on the screen and then the patient would would come in, usually in my previous practice. In this practice, the number I am coming to physically greet them and the waiting room.

R - Yeah, OK, yeah. Do they have a call bell or is that just something you kind of have to do?

113 - We do have a call Bell, but because of the way that. We because of the physical layout on the EMIS screen, we don't see our patients in the same rooms that we work from.

R - OK

113 - We have separate assessment rooms. And if you press, you know the button to invite somebody in it would flag up under just one GPs name which so there has been problems with accidentally hitting that and then the people have, patients have gone to that GPs room unexpectedly.

R - Yeah, and what do you prefer then? Like do you prefer when you were able just to call people in on the call screen, or do you prefer the current system where you're walking to greet them?

113 - I prefer going out and seeing people a because you can tell a lot about them, even just by by seeing them when they're not, they don't realize that they're being watched, or by the way that they walk into and into the room.

R - OK, and what was the barrier to you doing that previously, then in the previous practice?

113 - I think just time. My practice for an ST2 were extremely keen for me to get rattled down to 10 minutes as quickly as possible which I which I tried to facilitate and I took a lot of extra em, you know, squeeze-ins and stuff. So even 30 seconds you know from the press and cue or whatever, which gives me just an extra bit of time looking at their notes and getting the. Consultation started, just helps with the overall flow.

R - Yeah, that's it, OK? And yeah, so if you were able to, would you consider any workplace interventions that could help you reduce your sitting time?

113 - I have seen other people doing standing desks. I don't think I would have a problem with that necessarily, but I can, my practice have refused requests for relatively minor expenses. It's only very recently that I got headset, for example, and I've spent the whole year craning my neck to the left with the phone and I never, you know, got a second screen just to help with general productivity and things, but if those things have been rejected then it's very unlikely that they would consider a standing desk, or adaptations for standing desk.

R - But if you were in control, say you were, you know a partner or salaried GP in a different practice in future, you know how would you feel about something like a standing desk/

113 - I, I think a standing desk would be. It would be great. I had much less back pain when I worked in the emergency department and was on my feet all the time and using, using standing desks, so I would say I'm a fan.

R -And kind of knowing kind of how they work. How do you feel that you would? What about when patients are coming into the room, face to face for consultations? How do you feel about standing desks in that scenario?

113 - If it was one of the collapsible ones that can, they can go up and down. You can adapt it to the scenario, but if you're also seeing a patient in a different room from the one that you work from, the one that you think that you work from that's less of a problem. At the moment

our patient contacts are very specific and focused, and not quite time critical, is the phrase I'm looking for, but. You're wanting to get them in and out the door quickly to reduce exposure generally, so I. I suppose I haven't really given that a great deal of thought.

R - OK, yeah, but if you did have more time with the patients and they were in the room with you, you know, do you think you would be using it standing up while the patient's there? Or would you prefer to be sitting down?

113 - No, there's I'm aware, although I can't quote the actual paper or the author of research that says if you are sitting down and that the patient is sitting down, their perception of the time that has been spent with them and the perception of the care that they received as much higher as opposed to when both of you are standing or you're standing and the patient's, the patient's sitting so so no. Where possible, I would prefer not to conduct a my face to face appointments standing when the patient isn't.

R - Yeah yeah. Then if you were doing it remotely over the phone, would you be happy enough? You know if you're standing and moving around and that's happening?

113 - Yep. So if I had, I now have a headset, and if I also had a standing desk, that would certainly make plenty of room to to pace and to move around, which would be much preferable to sitting in a swing chair.

R - OK, yeah no, that's interesting. And are you aware of any initiatives that are aimed at encouraging GPs and practice staff and patients to be less sedentary and more physically active?

113 - Not locally. Some practices, some practices in Scotland I know were doing, were quite heavily involved in the parkruns. And I think before Pandemic, the RCGP were doing access for yoga and and specific exercise classes, but not I'm aware of anything more locally or more recently.

R - OK, yeah. Have you heard of the RCGP active practice charter?

113 - No.

R - No yeah, nobody has. That's fine and yeah, as GPs do you think it's important that we consider our own health choices in terms of our sedentary behaviour and physical activity, especially in terms of being role models for patients and how we interact with patients?

113 - Yes, absolutely. I don't think it's a good look if a patient comes into the room and it's stinking of smoke. Or the patient comes into the room you're trying to discuss weight loss with them and you're carrying an extra 2 stone yourself. It doesn't, you know, yeah, I think it is important we should role modelling for. For patients, because there's an expectation that we are more generally upstanding members of the community, and I think that overall physical health is a part of that too.

R - Yeah, it's interesting that that's something you know quite a few people have been saying that, but I have also had some responses from people saying that if all GPs were, you know, looked like personal trainers, super fit and super healthy that that mightn't be that helpful for patients who maybe are feeling, they may be less likely to open up about their own physical activity and things. What do you think about that?

113 - I'm, I think that most of that should be able to be offset by a bit of empathy on the GPs part and a bit of, just, careful consulting. Most I would I would say most barriers to communication should be. It should be surmountable by just a bit of thought and tact.

R - OK, yeah, no, that's a valid point, and you mentioned then in the previous practice, you know you were walking beside the practice. Some I have heard of other GPsthat quite like doing that, But then some of the other people have been saying that there being a bit of a barrier to that potentially is that. They don't really like bumping into patients outside of the practice, you know, because potentially then there might be a feeling that we're not working hard enough. If we have time to go out for a walk during the working day. And you know a bit of awkwardness that way you know with potentially bumping into patients, was that ever a consideration for you whenever you would have been out walking last year?

113 - No, because they knew when the practice was shut. So in my current practice, I know that when the reception staff go in even to Asda to buy some lunch they've been, you know, like verbally abused by patients for for being an 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.

R - OK, yeah, no, that's that's an interesting point as well. So those are all the questions that I have. But do you have any questions or comments or anything yourself?

113 - I suppose one other thing to say quickly would be. Obviously, Thursdays at the moment we are on zoom, for teaching, and those can be up to sort of eight or nine hour days, depending on what you have and that is time where you are. You know at your at your desk and you know, sitting down so. That would just be one other thing to draw your attention to. I'm sure it's been mentioned already, but that would be a bit different for this year.

R - Yeah, good stuff, but thanks so much for taking part.

Participant 114

R – How did you find wearing the accelerometer back in the autumn?

114 - Not too bad. It caused a bit of an indentation in my leg by the end of it, but it was it was it was comfortable enough. It was alright.

R - And I think looking at yours there was an issue with covid, but I think at the time, was there? You were having to self isolate?

114 - Yeah I had to self isolate for two weeks. So I was working from home which was a bit of a bit of a. Yeah wasn't it wasn't wasn't expected at the time.

R - Yeah, but I suppose that's just the nature of the of the time that we were working in. And also you know it was. We still needed to try and get this study done, so that's why we were able to do it remotely. Originally were planning to recruit people face to face, but we have to change plans to do it all remotely, but you weren't the only one that was affected with having to self isolate during that time, but unfortunately yours was the whole time that you were in. You know, in the study. Do you think your behaviour changed any as a result of wearing the accelerometer?

114 - Uh. Certainly the working working was different because I wasn't really I. You know I wasn't really getting up and going and seeing people as I maybe would have done as many people as I would have done. And you know I was just really doing sort of scripts and phone calls where I could do phone calls. You're not having to bring people in, so it probably did change what I was doing during that during that period of time, unfortunately.

EXPLANATION OF RESULTS

R - How do you feel? I know that's not typical of a normal week for you, but how do you feel about your normal overall levels of physical activity?

114 - Well, I mean like now that the gyms are open, I go back. I've been back in the gym. I go to gym 6 in the morning and the go in to work. Far more, yeah, more active in work, walking up and down at the moment I would cycle at the weekend. Do sort of 60-70 miles cycling on a Saturday. Yeah that yeah I'm far more active than I would have been during that two week period. Richard, definitely.

R - And then in general you know how things are now then. Are you happy with your levels of physical activity at the moment?

114 - Yeah, as I say I go to I I would go to, you know, go to the gym, I cycle if I can get back in time I would cycle on a, there's a Tuesday and Thursday evening cycle in the club that I'm in. I do that and then at the weekends I I'm out cycling and also then gardening as well at the moment so.

R - Very good and I think we probably got people that are more interested in their physical activity in this study, so there may have been an element of selection bias, but it's still interesting nonetheless. And this question I want to be patronizing this with this question, but I've been asking people in general just to say, you know, are you aware of any risks regarding lack of physical activity in terms of health risks?

114 - Yes, yeah.

R - And can you kind of name some things that you would think of?

114 - Cardiovascular disease. Obesity, then you've got increased risk of cancers and things. Yeah, there's lots of benefits. Osteoporosis.

R - OK, and then thinking about yourself, how do you feel about the amount of time that you spend sitting down when you're in work?

114 - Uhm? Probably I mean, I do. So probably do sit down too much, but then it's difficult with regards to general practice to have those you know things like stand up desks and things. I mean my my some of my admin staff the stand up desks, but it's it's difficult to, to bring that into the, you know the the surgery itself into my consulting room. I think patients would be a bit surprised to see you standing or certainly my lot would be surprised to see me standing at a desk. But yeah, no I think we do sit down too much.

R - And what about with more consultations happening remotely? Do you think that's an opportunity to potentially use things like standing desks?

114 - Uh, yes it would be. But then, you know, moment we haven't. We haven't got that in place. Yeah, it would be better if if we're going to continue doing things remotely, but then with you know people do want us to be opening up at the moment because we're not doing anything.

R - Well, I suppose that's perception in the media because there's less face to face appointments.

114 - I know.

R - But yeah, there's still plenty of work going on. It's just different than pre pandemic. Yeah, uh, and if you know if things were staying the way way they are, it may well be more of a hybrid model with, you know, a lot more remote consultations, but also with people coming in face to face. If it was to be like that, do you think it would be possible to use a standing desk in that sort of scenario?

114 - Yeah, and and certainly if, because we've been looking at keeping some of our you know rooms separate sort of clean and and then not clean. So yeah, then there may be an opportunity to bring a standing yeah desk standing desk into your own consulting room and then have the other room as your normal consulting space. But yeah, no certainly if it if it does,

continue with this, as you say this more hybrid style model, I think there is that opportunity definitely.

R - OK. Yeah, and apart from standing desks, are you aware of any other workplace interventions that can reduce or interrupt sitting time?

114 - Uh. Well, you, I mean, what were you thinking of with regards to?

R - Well, I suppose you know in your practice now or even you know pre pandemic would you have had a call screen in the waiting room or an intercom system or would you have gone to the waiting room to greet patients? Things like that?

114 - I went, I went out to to patients to I didn't, I didn't use, you know, we have the call system but I I always got up and went out and walked down and got them myself rather than calling them.

R - Then other things are things like, you know, active breaks you know having. Trying to incorporate a walk into the you know, during lunch time if there's time available or things like that.

114 - Uh. I mean, certainly you know if there is, if there was the opportunity, you know the problem is, you know we're quite a small practice, so you tend to be, there's only myself and one other partner. So we tend to be. You know on site, most of the time when we are. Well, we are in work. I suppose I wouldn't. Actively go and walk around the block. You know, when there are things you always end up getting called for things at the moment.

R - So you mean from like a workload point of view that would be limiting that?

114 - Yeah, yeah, yeah, definitely at the moment.

R - That's definitely been a theme that has come up. OK. And are you aware of any initiatives at a wider level aimed at encouraging GPs and staff and patients to be less sedentary and more physically active?

114 – No, I haven't heard of any schemes that have been trying to make GPs more proactive at being, you know, getting up up and about. I haven't heard anything about that.

R - OK, have you heard of the parkrun practice initiative?

114 - Uh, I have heard of parkruns, yeah.

114 - OK yeah, that's that's one of the initiatives. Its kind of combined with the RCGP to try encourage people to refer and practices to refer patients and be involved with the running of local parkruns. So that's one initiative. It's fairly well known. But have you heard of the RCGP active practice charter?

R - No, I haven't I'm afraid, sorry.

R - It's not too well known. There's not too many people have heard of it, which is interesting considering that you know. Again, people are probably more, the people I'm speaking to are probably more interested in their physical activity as well. This is just a general question, but as GP's do you think it's important that we consider our own health choices in terms of our sedentary behaviour and physical activity in our role, you know, in potentially being role models for patients or how we interact with patients.

114 - Yeah, 'cause I mean I do try and you know, try to encourage patients and. Yeah, we would discuss what I would. I would do as well. You know with regards to my exercise, you know at the weekends and things and try to bring that into conversations as a means of trying to encourage them to get out and about.

R - Yeah, but yeah there was. There was kind of a there's been, I think some people have been saying that it's important not to be, you know, saying one thing and and and being you know completely different in that you know it wouldn't be particularly wise if you had a pack of cigarettes on the table and telling people to stop smoking and things like that. So it's important to be contradictory with the message that people are getting, but there's also been the perspective that sometimes. It's important for GPs for patients to be able to feel that they can relate to their doctor. So if the doctor was somebody who looked like a gym instructor, or you know they might be feeling if they're not doing much exercise themselves, they may not be feeling so open, you know to actually explain about the amount they're actually doing, so I suppose it's it's getting the balance with it.

114 - I don't look like a gym instructor, don't worry.

R - Yeah, yeah, but that's it's been interesting just to hear those those perspectives with it as well. Yeah, so uhm. And in terms of, I think those are all the formal questions that I have there. But yeah, do you have any questions related to the study yourself? Or is there any other anything else you would want to comment on?

114 - I'm I, I think my the difficulty for me was just being caught up in that self isolation for that period. It 'cause it really, you know, just changed changed my behaviour hugely. You know I must say I did find working from home for those two weeks quite to quite challenging. It was a lot more difficult than actually being in in the surgery, yeah? But I only had to do it twice, so far so.

R - And hopefully not again, yeah. In terms of something else that's come up, there's people saying about they would be tracking their step count and things like that. Is that something you do or or do you track your physical activity in any way?

114 - I've gotta fit, I've gotta. I've gotta watch smartwatch now so to try and make sure that I I do I do. Do my my steps during the day, but then with a lot of things opening up. You know like the gym. I'm back in doing that and then I've always been cycling so it's. Yeah, I have been getting enough. You know more exercise. Through the cycling.

R - And do you find that monitoring using the Fitbit or I don't know if you use things like Strava with the cycling, but do you find that that encourages you to do more?

114 - Yeah, probably. I mean I. I have Strava for the for the cycling and then I use my watch just to see you know with regards to my steps and you know if you if you are the other sort of the 9000 level you would probably go for a quick walk just to get to 10,000 before the night type of thing. So yeah, it probably does encourage you to do that little bit more.

114 - OK, OK, no that's that's all the questions really related to it, but there are some interesting themes coming up and I think one of the barriers certainly on the working day of reducing. Sedentary behaviour, or yeah, one of the buyers with stopping people being more active is the workload in general practice.

114 - Yeah, yeah, definitely yeah. It's certainly not gone down.

R - No. Yeah, despite what might be in the press. Yeah, OK. Yeah, so that's that's that's the interviewed a man. So thanks so much for taking parts. I'll, I'll send you through the data. You know from that that we continue. Insight self isolation and at least you'll have something to compare to so that you'll be looking more favorably at your step. Count on the Fitbit now that you're not having to isolate, but. Thanks, thanks again for taking part. And yeah, we're now planning. We're in the process of writing up the accelerometer on the questionnaire study and to a paper which will be hopefully getting published.

Participant 118

R - Yeah, I suppose it's just how did you find wearing the accelerometer or back in the autumn?

118 - Yeah, I mean it was. It was fine until it got a wee bit irritating on the skin because I wore it for a week I think wasn't it? And and and once or twice, no I think once it became dislodged but I just put it back on with a new, umm, you know, the dressing but apart from that it was fine.

R - OK, no, that's good. Uh, everybody's been saying the same sort of thing. And do you think whenever you were wearing the accelerometer that you changed your behaviour any as a result?

118 -No

R – So you don't think you were more active or anything than normal?

118 – Em, well, I did before that, I had the standing desk. Before that, so I continued on that week with it.

R – Yes

118 - But in terms of my activity throughout my day, no. I would like I, you know, I train anyway. So that's why. And I walk a lot and do all things and probably have become more active because I'm now taking up cycling for the triathlon training. Swimming and stuff so you know what I mean, I've probably become more active outside of work time, you know.

EXPLANATION OF RESULTS

R - So pretty good results for you and I'm sure you're happy to see that.

118 - Yes, I am.

R - Yeah, uh, so that's, uh, impressive. I've actually just emailed a colleague with their results as well, so you'll be able to compare. Sorry. Uhm? So yeah, uhm, do you think that is fairly reflective of a typical week for you?

118 - Well, yeah, I think that, em, at the moment I'm I'm not. I'm not using the standing desk so much. I think there was a lot of activity when we were doing the COVID clinics. But I think that when I'm not at work the amount of activity that I do now has increased because I've taken on other activities as well as still doing the powerlifting. And because they're trying to lose weight, so I'm getting out more, you know, for more walks I'm getting out cycling and swimming, etc. So you know, there's that has been heightened as well as the powerlifting, so I think I'm probably doing more activity when I'm not actually sitting in the office than I was. But sitting in the office, my standing time probably has been less. I think it's just for me. At the moment time I've got lazy wee rut because I'm doing so much activity outside the workplace that it's just as handy for me to come in. Because the standing desk I have, you know you have to, It's

awkward, it's like yours and when you're seeing patients you have to take everything away to lower it down and blah blah blah, you know so, em, just for me. At the moment time I've been too lazy but I will have to get at it again and start doing my standing desk.

R - And uh, in general, how do you feel about your overall levels of physical activity?

118 - I think I'm feeling very fit. I I went with em, was it last weekend or weekend before? No it was the weekend before I went, I went hillwalking up into the Mourne and where two girls that I had gone with, I would have struggled to keep up with them in the past. I was like, one of them struggled to keep up with me and myself and the other girl, I could have surpassed her. Do you know what I mean so I think yeah. If you I am I am so I I like I was cycling at the weekend in Dunbar with a cyclist and we went. Spent the whole day cycling and the thing is that you know I I had no bother at all keeping up so you know. And this was like much more than I would normally cycle in a day and and you know it was fine. So I think my my fitness levels are better than they've ever been.

R - OK, yeah that's brilliant. I mean as I say those results from your accelerometer were very encouraging as well. So yeah, yeah, good work. And so this is how is it you managed to, you know, to fit in the physical activity. You know how do you manage to get the levels that you're kind of hoping for?

118 - I just do it. I get up, em, so in the evening times, you know, when I come home from work, em, make dinner then I usually train about 8 o'clock at night. Or on my half day I might train at 2:30pm and on a Thursday I train perhaps at 7:30pm. At the weekends and I used to get up early in the morning and on Sunday I always go walking for a couple of hours with friends, but I get up really early in the morning to do that. So when I'm back at home then I have time with the girls because they're probably just surfacing at that stage by the time I've come back up. So I fit my activity around times that's probably going to impact less on them, but I get it in. It's just. It's just a matter of doing it. And then because I work in the farm as well, and because I'm doing all the housework and stuff I'm up and down and doing all physical activity around the house, you know, I mean, so it's like I think you just do it without thinking, Richard, or you put it in.

118 - OK, yeah, uhm and ah yeah, because some of the other, the interviews I've been doing with other people have been saying it's tricky fitting it in around their workload. You know, with with feeling like they're very busy in in working in general practice as well. So it's encouraging that you're able to feel like you can manage it. So that's good to hear.

R - I'm a single parent that's that's managing on my own at home, so I think that if people are determined. They will always find time to do things, but they have to find that time they have to commit to it and they have to sacrifice sitting in front of the TV. I don't watch TV anymore really. I mean if I sit down for half an hour, that's about the height of it. But the rest of the time I'm up doing things because I have to. I have to and I want to, yes.

R - Yeah, yeah, no, that's a. That's encouraging to hear and so this is a question I've been asking everybody and it's just it's not trying not to be patronizing with it, but it's just to explore with everybody in general. Are you aware of any health risks regarding in, like insufficient levels of physical activity and how it affects people's health?

118 - Do you mean in general or mine?

R – Em, just in general, uh, yeah, for for patients and things. Are you aware of any health risks regarding not having...

118 - Yeah sedentary lifestyle with overeating and it's going to... like if you're sitting like a couch potato, you're going to eat more. You know, especially with lockdown and so forth. So I think that sedentary life leads to bad, em, bad eating habits, bad life choices, em, with an increased risk of diabetes, increased risk of cardiovascular disease. Increased risk of osteoporosis and deficiencies and high cholesterol, etc etc. So em yeah, and they probably. They probably then delve into your poor diet, smoking etc etc, which is their pastime and fits very well with a sedentary life as opposed to getting out walking, getting out exercising. No matter what you do. I'm actually, I'm actually signed up to do become a personal trainer as well. So that's for me to develop my, em, my wants and my interests and down a different pathway than general practice and which I also would probably carry out my own free time as well.

R - Yeah, no, that's fantastic. A good answer, and uhm yeah, so how? How do you feel about the amount of time that you spend sitting down in work?

118 - Yeah, I suppose like me. My my priority is, because I am busy. I need to get work done in work. I need to get paperwork done and when I'm standing, OK so I don't mind talking to patients and walking around the room. Sometimes walking helps me think. But but when I'm actually sitting trying to do scripts and trying to do paperwork. I need to be comfortable. I need to have no distractions. Because if I have distractions it's going to delay the speed of which I can work at. And because I have so much work to do, I need to get it done efficiently. So if I'm sitting and I'm comfortable and sometimes now I'll play some music, just to relax me, I can get through this stuff. If people just leave me alone. I'll get through it and do you know that sort of way? So that's why you probably didn't see that coming out of the room. Because I just want to sit. I want to get through it. I know what has to be done and you know, because it used to be, when my husband was alive and stuff that I got home at night time and maybe he'd have done a lot of the work, em, that I would have sat and worked for hours on the paperwork. But I don't get an opportunity anymore to do that, em, so sometimes I can up really early in the morning and I'll do some paperwork at home before I go in. If the girls are at school I'll take them to school. But now that they're off school, I can try and come in earlier of a morning to try and work through some stuff. So, so that's why for me. Yeah, it's probably not, em, it's probably not the best and I should be moving more when I when I'm at work, but because it allows me to do my paperwork more efficiently, then I think that's offset, by the amount of activity I do when I'm not at work.

R - OK, yeah, well that's uh, that's that's interesting. And apart from the standing desk, are you aware of any other workplace interventions that could reduce or interrupt setting time?

118 - Well, yes, you've tried to drag me out for walks at lunch time em, and so, or you know what, I suppose when we're seeing patients, though there's probably not that many face to face interactions as there would have been in the past, so you know, going up and down the corridor even that, because I. My room is further than anybody else's away, so it's up and down the corridor for each time to get a patient or walking up and down rather to telephone people you know. Actually walking up and down, you know what I mean, to get things and maybe don't take a pile of stuff at one time, make sure you have to make several trips with small amounts you know, and that's probably it.

R - Yeah, OK, uh, and uh, are you aware of any, uh, initiatives that are aimed at encouraging GPs and their patients to be less sedentary and more physically active?

118 - No.

R - No? Em, have you heard of the parkrun practice initiative?

118 - No

R - No? Or the RCGP active practice Charter?

118 -No.

R - No, that's fine. OK, yeah, not many people have heard, especially the RCGP one. And and, uh, then another question is, as GP's do you think it's important that we consider our own health choices in terms of sedentary behaviour and physical activity, especially in our role of potentially being role models for patients and how we interact with patients?

118 - One hundred percent.

R - OK.

118 - Yeah, you can't be preaching if you're not practicing.

R - OK uhm yeah, a lot of people have been saying that, but there was a another experienced GP I was speaking to. Who said that, uhm, they didn't feel like it was the GPs... If every GP looked like a personal trainer or you know somebody who's really fit and super fit and super healthy, then patients might not be able to relate to them quite the same way and be open with them about their own struggles and difficulties with exercising and things...

118 - Nah, nah.

R What do you think about that...

118 - About that statement?

R – Yeah

118 - I think that's a cop out.

R – OK.

118 - I, I think that's a cop out. I think that's nonsense. Because I think that if GPs, you don't have to be a PT, I don't look like a bloomin PT. You know I probably will never look like these gym fanatics that look the the with the most brilliant figure. But at the end of the day... like I mean, do I want to go and start smoking and start taking drugs just so that people who are taking drugs and smoking and doing all those bad habits can relate to me because I do it along with them? Do you know what I mean? That's nonsense. I mean, at the end of the day and you don't have to look like these fantastic, beautiful model-like people. But you know you don't have to be hugely overweight and wading in and and you know that and you're going to have a heart attack in the next 10 years or something. You know what I mean? Because at the end of the day, you're trying to promote. And how do you promote a healthy, a healthy lifestyle? By actually trying to lead a similar healthy lifestyle and, em, I think that that is evident from somebody who's sitting in front of you. D'you know I mean? And so people will then say, "well, OK," but it's how you approach people. It wouldn't matter if you're overweight or if you were underweight or whatever. 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 here with them, so it's how you communicate with people. You're not telling them off, that's ridiculous. People have been taught, you know, told off by GPs in the past and come in and they feel absolutely wick, you know. I mean, it actually contra, it sort of it has the opposite effect and people feel then quite depressed and they don't see any way forward. Whereas just some things, like I would I see highlight people myfitnesspal. It's a very simple program, it's a very simple thing of quite literally tracking your calories. You know what to eat. It's not like these fad diets. You know what I mean, but it's like tracking your calories and you work at that for a while. And if that it loses you, weight, you're losing weight. That's what you stay at. And if it's if you're losing too much weight, you need to eat a little bit more. If you're putting it on then you drop it after a period of time. So this is just a way of tracking. Do you know what I mean? And so it's just a very simple program. Just something as simple as that and you know. And just being there for people's, em, just to support them, you know if they come in you can say if you want to come back to me I'll weigh you, or you can send in your wieights to me, you can let me know how you get on, blah, blah, blah and all the rest, you know. And and and so you know, not everybody wants to go to the gym; get out walking, get out doing something else. But it's I think more about the communication as opposed to the look.

R - OK, yeah, no, that's a that's a very good good answer as well. And and, uh, just one thing that is quite popular. You know with with another colleague and myself is trying to get out

walking during the day. How do you feel about, you know, getting that in alongside the workload of GP? Do you think it is kind of doable?

118 - For me? No.

R – Mm hmm

118 - For me, I will try to get out as often as I can, but that's not very often, because as far as I'm concerned, if I'm there to work, I want to get through the workload. Because if I don't go through the workload when am I going to do it? So that takes priority over anything else. When I'm in work, but when I'm outside work I will make good use of my time outside work. So over a 24 hour period I will have exercise. It doesn't matter when you exercise as long as you have your exercise. So I address my lifestyle needs at different times of the day. But when I'm at work my priority is I get through the work. That's my priority.

R - OK, yeah, no, that's a that's. It's a good point and a lot of it does seem to be, you know, from speaking with other people, workload is a big part of it and, you know, people have been making the point that if you can't get through the workload during the day and you were taking extra time and that that meant you were having to stay later, then they would always prioritize trying to finish the day on time or as close to time as possible and allow them to get home and see children and things you know, than, you know, managing to try and get out during the day if they know that's gonna make them have to stay later at the end of the day. So it's a. It's a good point. And if you do, when you do manage to get the time to get out for a walk at lunch time, do you find that? Does? Do you feel better afterwards? Or does that affect how you how you can work in the afternoon?

118 - You feel a bit elated and you know what I mean? So you do and you know and feel like you've done something at least you've got the steps in and you get out in the fresh air you got your head showered. Rather than just sitting all the time, do you know what I mean?

R – Yeah

118 - But uhm, you know? So but yeah, like I mean. That's the ideal situation.

R -Yes.

118 - But having said that, you know if I'm here working full time on a all day on Monday and Wednesday. That's only two days, Because as soon as I finished a half day on a Tuesday, you know that I go straight from there to training for an hour's training and then on the Thursday. You know, I don't usually work on a Friday, it's alternate Fridays I work, do you know what I mean. And a lot of time. So really. On a rolling weekly thing, it's only the Monday and Tuesday that I'm here all day that I'm not getting probably some kind of exercise midday.

R - Yeah, yeah, uh. No, that's important as well. In terms of how it fits into the overall lifestyle as well. So those are all the questions I have for you. Do you have any other questions or comments or anything yourself?

118 - No, no no. I think it's just that I think probably the Fitbit, Fitbit or whatever the thing was. Didn't probably, for me personally, didn't record everything accurately, but that's neither here nor there. You know. I mean, it still was a good result. I think it could have been a bit more impressive because of what I do do outside. But that's neither here nor there, I'm still very happy with it and it was a pleasure helping you. And it's very interesting to see the results you know. And I thought probably that my result would be good. I hoped it would be good.

R - Yeah, I know it's it's definitely when you compare it to the overall average. It's, it reads very well. So well done, good work.

118 - But it was like pleasure to help you and and you know, I'd love to see your final project.

Participant 119

R - But thinking about back to the autumn when you were wearing it. How did you find wearing the accelerometer?

119 - Yeah it was. It was OK. I think em, it's I was just. Just a bit annoying. Like about annoying, but no it was fairly under your clothes or like kind of caught on things every so often, but no it was grand, it ws good.

R - OK and do you think you changed your behaviour as a result of wearing the accelerometer?

119 - I don't think so.

R – Right.

119 - I think yeah, I think I was quite sedentary that week anyway. I would say fairly sedentary, but no, I don't think I did.

EXPLANATION OF RESULTS

R - So yeah, looking at that data and then in general, how do you feel about your overall levels of physical activity?

119 - I probably feel like I'm not as active as I should be, probably. I think going off 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 kinda feel like. I mean we just go for a few walks, but other than that don't do any other physical activities like running or cycling or for sport at the moment. So I feel like I could definitely improve on that.

R - What's what's stopping you then? From from, you know, doing as much as you would potentially like to do?

119 - Probably just not. I think not having a routine. I think it's starting and then building it in as a habit, so yeah.

R - How did you find that it was, uh, you know, how do you find working in the hospital setting compared to when you're in GP in terms of your physical activity?

119 - Oh yeah, it's definitely more just because you have to walk between buildings and even like going to the canteen to get coffee. It's quite a distance. So you definitely will get more steps on on a day in hospital, and you probably. Probably just generally feel a bit more energetic then maybe because of that.

R - OK yeah, so you feel more energetic when you're in hospital and moving around more.

119 – Yes.

R - Right, yeah, OK? And yeah, this is something without trying to be patronizing I'm asking everybody this question, but so are in general. Are you any? Are you aware of any health risks regarding insufficient levels of physical activity?

119 – Em, I suppose. Health risks. I'm sure there are many, but I'm just thinking like if you're not physically active, you're a risk of. You know, putting on weight the leavings like increase risk diabetes heart disease I suppose as well as if you don't have good levels of physical activity, so there definitely are I think it's just maybe. Sometimes I think you think if you're not overweight you're not at risk, em, you don't hear as much emphasis on the physical activity side of things, I think.

R - Yeah no, that's good point. Yeah, it's true because kind of they are interconnected in some ways. But there are also other independent risk factors as well. And thinking back to when you were working in general practice, how did you feel about the amount of time you're spending sitting down when you're in work?

119 - Em. I think, well we had. We did have standing desks so I wonder is that reflected and so are they. Yeah, kind of, Non-official standing desks so I wonder whether that was reflected in my results, but I'm. Yeah, I think you don't mind sitting for so long, but I think you just feel lethargic and then, especially in the afternoons, I think em, you definitely feel more lethargic. So what was the question again, sorry?

R - Yeah, yeah it was just how you. How did you feel about the amount of time you spend sitting down in work?

119 - Yes, I think you definitely feel like oh goodness I need to go home. I should really go home and do some exercise 'cause you have just been so I sedentary all day yeah.

R - And did you manage to exercise when you got home after a long day at work?

119 - I don't really think so. I think it was always a thought, but I think sometimes I would have gone out for a walk, maybe in the evening with a friend, but em, not consistently, I'd say, so, not really.

R - Yeah, I think that's kind of been coming up is that people feel so kind of tired after a day at work, especially sitting down all day and just being busy with mentally exhausting work that they kind of struggle to then have the motivation and the energy to do that at the end of the day, after you get home and dinner and everything.

119 - Yeah, definitely. I think as well. It was winter time, I think when we did the, had the accelerometers on. Is that right?

R – It was like, yeah October towards the end of October.

119 - I wonder was that partly as well the dark, darker evenings then kind of putting you off going out, as well as kind of the long day at work.

R - OK, yeah. And so yeah, obviously you are aware of the having standing desks in work, but are you aware of? Or are you aware of any other interventions that could help to reduce or interrupt sitting time during the working day?

119 - No.

R - Yeah. OK, and yeah, what were your experiences of using the like a standing desk in work? What did you think of it?

119 - Yeah, I definitely. I enjoyed it. I think it was good to have the mix of being able to sit and stand and I think I felt more alert when I was standing. If I was tired, standing kind of helped me feel more in even in the consultation. But no I, em, yeah, I think you definitely feel better when you're on your feet.

R - OK. And was there any negatives then of having a standing desk? You know that you didn't like so much.

119 - Em, goodness. I can't think of any.

R - Right, OK, yeah I think. A colleague mentioned a concern about varicose veins and you may not be able to concentrate as well. Yeah, would that be a concern. Had you thought of anything like that?

119 - I think I probably I think I felt like you could probably concentrate. I thought my concentration was better actually standing up because I felt less, sluggish. I hadn't thought about the varicose veins but that is, I'd imagine, could be a result of that maybe?

R - OK, and when you had patients coming into the room for face to face consultations, how did that work with the standing desk?

119 - Oh, I would have always sat down with patients then. Yeah, just so that you feel on the same. So that they could have a seat, and then you kind of feel on the same level as them.

R - OK, yeah, no. That's the same for me too. OK, and are you aware of any initiatives that are aimed at encouraging GPs and their patients to be less sedentary and more physically active?

119 - No.

R - Have you heard of parkrun practices?

119 - Oh, I have actually yeah yeah.

R - And have you heard of the RCGP Active Practice Charter?

119 - I haven't.

R - But yeah, Nope, nobody has, that's OK. Yeah, it's it's. It's interesting, just I. Nobody thinks about it and OK. And, you know, in terms of comparing working in the hospital where you're

moving around a lot more and then working in general practice where you probably spend more time sitting behind a desk, what? What do you prefer? You know in terms of the sort of environment that you're in?

119 - In terms of the environment itself or the ability to move around?

R - Kind of the ability to move around.

119 - Yeah, yeah, I think definitely hospital there's generally more space for that. You're doing it naturally, just if you're on a ward. You're kind of going to and from patients to and from the nurses station, whereas in GP you're just very much in your room until coffee time or lunchtime and so it's definitely useful for that kind of exercise to be built into your job where you have to move around yeah.

R - And even with being more active in, you know during the working day when you're working in hospital, do you still feel like you have enough energy at the end of the day? If you did want to go out and go for a walk or exercise?

119 - I think because the job is a lot more nine to five. You get away at five so you still feel like you can maybe even have a bit more time to. I suppose I live closer to here as well, so those factor in so you still have time after dinner to do that.

R - Yeah, OK and yeah, final final question is just as a GP. Do you think it's important that we consider our own health choices in terms of sedentary behavior and physical activity in terms of the role of being role models for patients or how we interact with patients?

119 - Yeah, definitely think if you are. I think if you are giving lifestyle and dietary advice to patients to follow you should probably be trying to follow it yourself as best you can. Yeah, just so that. Yeah, I think GP's or doctors in general should be examples of good health and to promote looking after yourself. Yeah.

R - Yeah, it's interesting some some other... in the interviews. There's been other viewpoints of that, although it's important that we do consider our own health choices. Also, we need to, patients need to feel like they can relate to us as well. So then if everybody was, you know, looked like a personal trainer. If every GP was like that then it mightn't be that easy for patients to be open with the doctor about what they're really like.

119 - Yeah? Oh, that sounds like an excuse.

R - OK.

119 - Is that really bad to say.

R - No.

119 - I kinda feel like. If you're gonna motivate a patient, you know. I suppose if, if you're calling a doctor a role model that's something to aspire to, and so I think that. I think, em. You know,

obviously every GP has. You know you may have different health issues or time constraints, or children which prevent you from exercising, but I think we all can eat well and we all can, you know it's our choice how we use our time and everyone probably benefits from a healthy lifestyle, so I think as much as I probably don't, eh, yeah fully, you know I don't practice what I preach, you know I feel like we should, just we should do that and that's what we should aim for and that I suppose that should I think that's that should be a motivator for patients, em, but even then. Yeah, yeah. I'm maybe being very harsh.

R - Yeah, no, that's that's. That's good to get everybody's perspectives. And yeah, that's all the questions that I have. But well, I suppose the other thing is with practice. You know, getting out for lunch walks during lunch break. Did you ever find any any problems with that? Or any concerns about that?

199 – No. I think that was a very that was great. I think we were just very lucky where we were as well. Just that you had that walk. That was quite nice actually. You know it was a nice surroundings as well, so that was great and just doing it together meant that there was like a peer drive to go.

R - Yeah, some of the other. Some of the other people I've been speaking to were saying that sometimes they get put off by seeing potentially meeting patients if they're walking during lunch break. And for various reasons. But you know, awkwardness sometimes, like not remembering somebody's name or potentially feeling like they might get asked for advice you know from a patient or even patients feeling like doctor shouldn't have time during the day. Whenever, you know, people are looking to get appointments, that doesn't really seem, patients feeling like people shouldn't have time to get out walking during the day. What do you think about stuff like that?

119 - Yeah, I think. Yeah, again, I think. I don't think that should. I suppose I don't think anything should put you off, you know, doing a walk on your lunch break because everyone's entitled to a lunch break and. I suppose maybe from from an awkwardness point to be that could happen when are out for dinner as well. You know you can bump into people anywhere I suppose, so so I am, but it might slow down your walk, which would probably be more frustrating if you got caught up in conversation. You'd just say, you know, we're on our lunchbreak, we're not, you know if you have an issue just phone the surgery kind of thing. And yes, so yeah, no, I think I actually think it's, again I probably would argue that it's a good thing, you know, it's again an example of showing, oh like you can actually build exercise into your working day and use it as a chance to socialize and get outside with other people where you have that motivation factor as well.

R - Yeah, no, that's that's that's that's great, uh, and do you have any other questions or comments or anything relating to the study or anything in general?

119 - Em. I suppose let me think, do I have any questions? Do you have any other suggestions of how you can build in exercises? There's standing desks and lunchtime walks? Are there any other things that you've been thinking about?

R - I suppose it's a another thing is trying to avoid using the call bell when you're or you know like a call screen, to bring patients into the waiting room because that means that if you're, especially if we're doing more face to face consultations again, then that means you get break. You know, every time a patient is coming in and out of the room you get a break to actually get up out of your chair and do get a few steps. Depending on the layout of your practice, but that can certainly help and it also can lead to better rapport with the patient as well. So that's something that I think should be encouraged, but a big drawback for lots of the physical activity interventions is that workload and not having the time to do that where you feel under so much time pressure that you just have to click the next patient, get them called into the room and read up their notes while you're doing that, because you've such such workload pressure. So there's definitely lots of ways that you can be more active. It's just having the. Being able to fit in, you know, alongside the work, workload commitments and things as well.

119 - Yeah, I suppose the other thing that I just thought of, was again, both partners had the Bluetooth headsets where you can like walk around the room when you're wearing them so. Those are probably quite useful. Because I was kind of tied to the desk a bit by my headset, so that was. And then you just write your notes up after. So I thought that was probably quite a good way of building in a bit more movement.

R - Yeah, and then the other thing is just taking breaks to bring scripts like into reception or, you know, just going to reception to discuss things with people. Things like that, but again, it's just getting the time to do that so.

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