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CHSS
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Centre for Health Services Studies

EVALUATION OF A PHYSICAL
INACTIVITY PILOT DELIVERED
IN PRIMARY CARE
SEPTEMBER, 2016
COMMISSIONED BY KENT
COUNTY COUNCIL

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University of Kent.

Acknowledgements

Let's Get Moving (LGM) is a physical activity pathway developed by the Department of Health. Kent County Council commissioned ukactive to deliver the LGM intervention and Centre for Health Services Studies, University of Kent to conduct the evaluation. Dr Sarah Hotham led the evaluation, with assistance from Vanessa Abrahamson who undertook the telephone interviews with participants and staff.

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1. Executive Summary

This report details the evaluation of a nationally recognised physical activity programme – Let's Get Moving (LGM) – developed by the NHS and the Department of Health (Department of Health, 2012). LGM is a 12-week programme delivered in a primary care setting by Community Exercise Professionals (CEP). The programme focuses on the use of Motivational Interviewing (MI) techniques to promote positive changes in health behaviour. Kent County Council (KCC) Public Health commissioned ukactive to deliver LGM through two GP Surgeries based in north Kent, in partnership with Dartford, Gravesham & Swanley (DGS) and Swale Clinical Commissioning Groups (CCG).

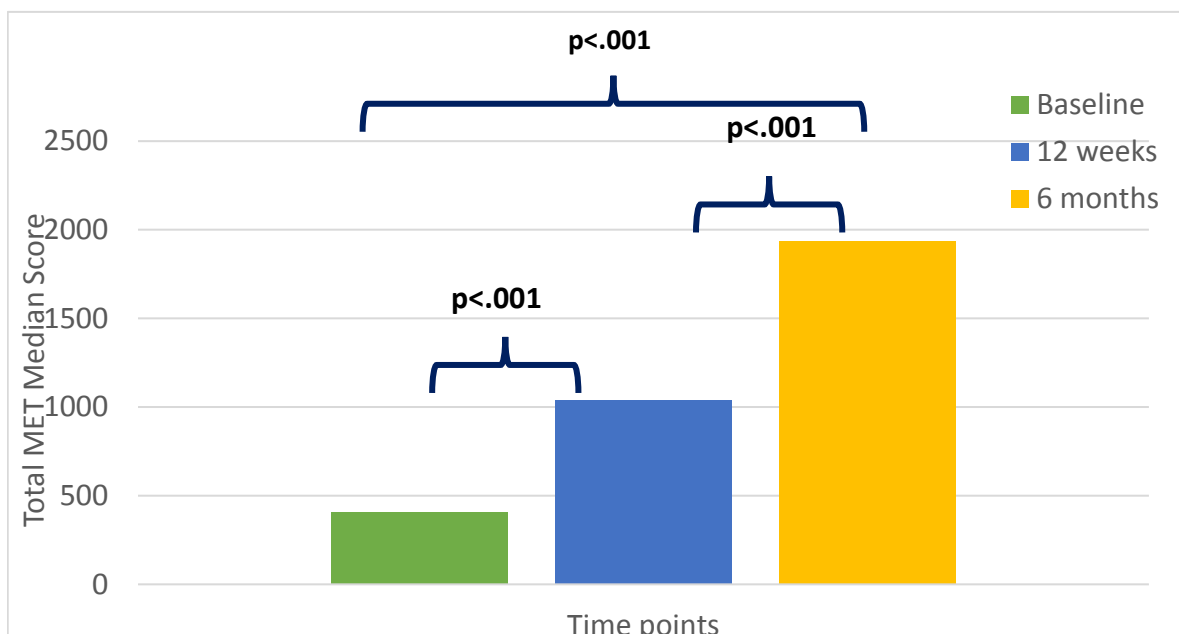
KCC commissioned the Centre for Health Services (CHSS), University of Kent, to conduct an evaluation of LGM's impact on participants, and to explore the intervention's reach and implementation. The evaluation employed a mixed-methods approach, using participant questionnaire and interview data to assess impact on physical inactivity. Interview data from the practice managers, GPs and CEPs was also collected to explore the LGM intervention's implementation and adaptation.

A total of 242 participants enrolled on the LGM intervention between August 2015 and February 2016. At baseline, participants self-reported their level of physical activity (IPAQ-short form), confidence to engage in physical activity and the importance of physical activity. These measures were assessed at baseline, 12 weeks and 6 months. Further IPAQ assessments will take place at 12 months, beginning in August 2016 through to February 2017. This data will be analysed and reported on April 2017.

Main findings

Impact on physical activity

- Overall, **statistically significant increases** in walking, moderate and vigorous activity were observed at **12 weeks** and **6 months** compared to baseline levels.
- **Total physical activity significantly improved from baseline** at both **12 weeks** and **6 months** and between **12 weeks** and **6 months**.



- **62.1%** of participants were categorised as 'low' for overall physical activity at baseline. At 12 weeks, this proportion **decreased** to **30.6%** and to **19.3%** at 6 months.
- **30.4%** were categorised as 'moderate' for overall physical activity at baseline. At 12 weeks, this proportion **increased** to **52.0%**, then fell to **42.4%** at 6 months.
- **7.5%** were categorised as 'high' for overall physical activity baseline. At 12 weeks, this proportion **increased** to **17.3%** and **38.6%** at 6 months.
- **70.3% (n=121)** of the participants who returned at 12 weeks report a **positive change** in total physical activity, with this rising to **87.1% (n=142)** from the sample of participants who returned **at 6 months**.
- Of the 92 participants who reported an increase in physical activity at 12 weeks, **64.1% (n=59)** reported **further increases between 12 weeks and 6 months**. This suggests that the majority of participants who initially increased their levels of physical activity were able to maintain or further improve this increase at 6 months.
- Of the 34 participants who reported a decrease in physical activity at 12 weeks compared to baseline, **85.2% (n=29)** subsequently reported a **positive change in behaviour between 12 weeks and 6 months**.

Types of physical activity

- Walking and moderate physical activity were the main drivers of the uptake in physical activity. Of the 121 participants who reported an increase in activity at 12 weeks compared to baseline, **75.2%** reported an increase in **walking** and **65.3%** in **moderate** activity.
- Of the 142 participants who reported an increase in physical activity at 6 months compared to baseline, the improvement was driven by **vigorous activity** for **42.3% (n=60)**, by **moderate activity** for **82.4% (n=117)**, and by **walking** for **66.2% (n=94)**.

Gender and physical activity

- A significant increase in walking activity was observed in both males and females, which suggests that the impact of the LGM intervention on walking was equivalent across genders.
- Differences according to gender did emerge for vigorous activity. Levels of vigorous activity only changed significantly for females, which suggests that the noted improvement in vigorous activity was predominately among this group of participants.

Quality of the intervention

- Only a small proportion (1.2%, n=6) reported the intervention's location or hours as unsuitable, which suggests that the use of GP surgeries as locations for health improvement services is acceptable to patients.
- The sample that attended an appointment **64.0% female (n=158)**, **36.0% male (n=89)**. This suggests that using GP surgeries for recruitment was, to some extent, more appealing to females than males.
- The intervention recruited a larger proportion of older males compared to females. Conversely, a higher proportion of females were recruited from the younger age groups.
- Overall, **59.7% (n=148)** of participants indicated that they had an underlying health condition or self-identified as disabled. The number of different types of co-morbid health conditions or disabilities reported by participants ranged from one to five. **34.7% (n=86)** reported one health condition, while the remaining **25.0% (n=62)** reported multiple health concerns. This suggests that the LGM intervention was a highly effective method of recruiting individuals with multiple underlying health conditions and disabilities. These are 'high value' individuals, who typically may not be able to participate in mainstream sport offerings.

2. Introduction

This report details the evaluation of a pilot programme focused on the delivery of a nationally recognised physical activity programme – Let's Get Moving (LGM) – developed by the NHS and the Department of Health (Department of Health, 2012). LGM is a 12-week programme delivered via primary care by Community Exercise Professionals (CEPs). The programme focuses on the use of Motivational Interviewing (MI) techniques to promote positive changes in health behaviour. Kent County Council (KCC) Public Health commissioned ukactive to deliver LGM via two GP surgeries based in north Kent, in partnership with the Clinical Commissioning Groups (CCGs) for their respective areas.

2.1 Background

2.1.1 Physical inactivity

Regular physical exercise is a vital factor in the prevention and treatment of various health-related conditions (Lee et al., 2012). As such, the Department of Health's recommendations specify that adults should engage in at least 150 minutes of moderate physical activity each week (Department of Health, 2011). Moderate physical activity includes walking, cycling, gardening and dancing, as well as lower-intensity sport and exercise activities.

Self-reported data collected by the Department of Health suggests that, overall, fewer than half of all adults meet the current physical activity guidelines (Department of Health, 2011). However, objectively measured data suggests a much lower proportion – less than 10% (NHS Information Centre for Health and Social Care, 2009). More recent data shows that 45% of women and 33% of men do not engage in the recommended amount of physical activity (Public Health England, 2014). With regard to Kent, the latest figures suggest that 28.37% of adults in the county are currently classed as physically inactive. Furthermore, the number of physically inactive adults in Kent increased by 1% between 2012 and 2013.

2.1.2 Physical inactivity interventions

Interventions aimed at changing behaviour utilise a variety of techniques to address the reported high levels of physical inactivity and promote positive change. Recent systematic reviews suggest that the most effective techniques are self-monitoring, teaching individuals to use prompts to promote physical activity (Olander et al., 2013), and self-monitoring of behaviour and goal-setting to promote walking (Bird et al., 2013).

Building on this research evidence, the NICE guidance (2014) on behaviour change interventions recommends the use of interventions that will motivate and support positive change. One such intervention is MI, which focuses on a patient-centred approach in order to strengthen the individual's intrinsic motivation to change their behaviour (Miller & Rollnick, 2002). MI consists of two main phases – building motivation for change and strengthening commitment to change. This process of change is driven by the individual concerned, who identifies the reasons for change, barriers and challenges, their motivation and their level of confidence in their ability to change. In partnership with the professional, individuals set goals, devise plans and commit to the process of changing their behaviour

(Dixon, 2008). As such, MI encompasses the techniques identified by research as effective, and therefore provides an ideal intervention for improving health outcomes. A recent review of MI in medical care settings supports this assertion, and concludes that the approach is particularly effective at decreasing sedentary behaviour (Lundahl et al., 2013). Recent evidence also suggests that low-intensity MI interventions can be effective in the initiation and maintenance of long-term changes in physical activity (Hardcastle et al., 2013).

2.1.3 Let's Get Moving Kent: Evaluation

The evaluation detailed in this report had four main aims:

1. To establish whether recruiting participants through systematic screening of GP surgery patient lists is recommended
2. To establish whether recruiting participants through systematic screening of GP surgery patient lists is an effective method of recruitment
3. To establish whether recruiting a practitioner workforce specifically to deliver interventions is feasible and effective
4. To explore the characteristics of service users who successfully changed their behaviour, who could be used to predict success in future cohorts or identify service users likely to require greater support.

These questions were addressed via a mixed-methods approach, using participant questionnaires and interview data to assess impact on physical inactivity. Interview data from practice managers, GPs and CEPs was also collected to explore the implementation and adaptation of the LGM intervention.

3. Methods

The TIDieR (Template for Intervention Description and Replication) checklist (Hoffman et al., 2014) has been recommended as a means of improving the reporting of behaviour change interventions (Johnston, 2014). This checklist ensures that complete descriptions for an intervention are reported, thereby facilitating a reliable basis from which future research can be replicated and built upon. The TIDieR checklist includes 12 sections,¹ all of which are covered below when describing the LGM intervention in Kent.

3.1 Measures

3.1.1 Quantitative data

Physical activity

The International Physical Activity Questionnaire (IPAQ-SF, WHO 1998; Craig et al., 2003) was used to assess levels of physical activity. The IPAQ is designed primarily for population-level measurement of physical activity in adults and requires participants to report on three types of activity –vigorous, moderate and walking.

The measure has undergone extensive reliability and validity testing across different countries and in different languages (Brown et al., 2004; Craig et al., 2003; Hallal & Victora,

¹ The 12 sections are listed in the blank copy of the TIDieR checklist included in Appendix 1.

2004). Overall, the results from these studies demonstrate that the IPAQ is appropriate to many settings and can be adapted to different languages, and is suitable for national population-based prevalence studies of participation in physical activity.

Participants were asked to recall the amount of time they have spent walking and being physically active in the last seven days. With regard to walking, participants were asked to recall how often they walked for at least 10 minutes at a time. Physical activity was broken down in to two categories, based on intensity:

- 1) Moderate (activities that require moderate physical effort and make you breathe somewhat harder than normal)
- 2) Vigorous (activities that require hard physical effort and make you breathe much harder than normal).

For all categories of activity, participants provided responses for the total number of days and the typical number of hours and minutes spent engaging in the activity on those days.

Confidence and importance measures

Levels of confidence were assessed with a one-item question: ‘On a scale of 1–10, how confident are you that you could become more physically active if you wanted to?’ Here, 1 means not at all confident, while 10 means very confident. Higher scores therefore equate to higher levels of confidence.

Importance was also assessed with by a single question: ‘On a scale of 1–10, how important is it to you to become more physically active?’ Here, 1 means not at all important, while 10 means very important. Again, higher scores equate to higher levels of importance.

Anthropometric measurements

Height and weight measures were also taken from a small sample of participants recruited from the Surgery 2. Participants were also offered a blood test to assess HbA1c levels, but no one chose to take this option.

3.1.2 Qualitative data

To augment the quantitative data collected from participants, a number of one-to-one interviews were conducted. The aim of these interviews was to explore participants’ overall views on LGM, how it was implemented in practice and how it helped change behaviour.

To explore the implementation of LGM, interviews were also conducted with the two practice managers: a GP based at one of the sites and a Community Exercise Professional (CEP).

The research team developed interview guides for all groups (see the appendix).

3.2 Materials

ukactive designed and supplied the majority of participant materials:

- GP invitation letter (English and Punjabi versions). Surgery 2 had a high number of patients of Asian or British Asian ethnicity and so to mitigate any language barriers, the letters sent to these patients were written in both Punjabi and English.

- A 12-week activity diary (quantified in minutes)
- A sheet for recording activity goals over the 12 weeks
- Monthly newsletter sent to participants via email
- The ukactive LGM Kent website, which directed participants to local physical activity opportunities (not operational until the final weeks of the 12-week programme)
- User experience feedback form.

The University of Kent supplied the information sheets and consent forms for the qualitative aspect of the evaluation (see the appendix).

Intervention

The LGM intervention is a nationally recognised programme utilising motivational interviewing (MI) to promote positive behaviour change. The 12-week programme is delivered by Community Exercise Professionals (CEPs) on a one-to-one basis and is hosted in primary care.

The two CEPs recruited had considerable experience in the health and fitness profession. The CEP recruitment process prioritised local exercise practitioners in order to ensure that deliverers had local knowledge. One CEP was employed full-time with a local leisure trust, which agreed to release them one day a week for LGM. No other local recruitment was possible, hence the second CEP was recruited from another LGM programme in London and travelled to Kent. The local CEP was new to LGM, but had local knowledge. The London-based CEP was experienced in delivering the programme, but had little local knowledge. The local CEP was Punjabi-speaking.

Prior to the CEP delivering the LGM, ukactive provided a comprehensive two-day training workshop. Core elements of the training course were as follows:

- Introduction to MI principles and training in key MI techniques
- Information on the LGM programme and how it is structured
- Review of the recruitment pathway
- Introduction to the IPAQ and how to complete them
- Information regarding physical activity opportunities in Kent to which participants could be referred
- Meeting with Local Authority leisure trusts and local physical activity providers, in order to facilitate relationships between these organisations and the CEP, and to gather information about the types of activities available to the participants
- Review of ukactive participant materials, e.g. case study form and activity goals record sheet
- Review of ukactive policies, e.g. safeguarding, confidentiality and consent procedures
- Training in ukactive reporting systems and data collection.

In addition, ukactive holds a quarterly CEP 'Get Together', at which CEPs from different projects come together with the coordinators to discuss any issues, address any technical queries and propose ways in the service could be improved.

During the 12-week period, participants were provided with a brief MI intervention by the CEP in the first and final session. Between these two sessions, the CEPs provided personalised support via email and telephone.

Motivational Interviewing, which was originally used by clinicians to assist patients with a history of substance abuse (Miller, 1983), has since been further developed to support change across a wide-range of behaviours, e.g. weight loss (Armstrong et al., 2011); dietary modification (Hollis et al., 2012); and physical activity (O'Halloran et al., 2014). The effectiveness of MI as an approach to support successful behaviour change has been evidenced in a number of systematic reviews (Armstrong et al., 2011) and meta-analyses (Lundahl et al., 2010). NICE guidelines also highlight this technique as a suitable approach for the management of complex behaviours such as alcohol and substance misuse (NICE: CG115, 2011).

Motivational Interviewing facilitates a variety of techniques in order to evoke behaviour change. It allows the CEP, in a flexible manner, to guide, direct or follow the participant as the situation unfolds. The CEP focuses on behaviour change by asking open questions, using affirmations, reflective listening and summarising participant feedback. In addition, the CEP can choose from a number of strategies and tools to engage the participant, e.g. setting the scene, agreeing the reason for the appointment, describing a typical day, discussing the benefits and challenges associated with behaviour change, and assessing current levels of confidence/importance. The one-to-one session ends with the participant setting realistic goals and agreeing a plan. MI is based on tailoring the approach to the individual; hence the structure of each appointment can differ according to the individual's needs.

The CEPs shared information on physical activity opportunities in the local area, e.g. pointing participants towards local Leisure Trust-operated community leisure centres and swimming pools, local council activities, KentSport, Explore Kent, and KCC Country Parks. In addition, ukactive developed a Kent-specific website detailing local activities that became available as the final (12-week) appointments were scheduled. This resource was developed to help sustain activity levels, but it was not available during intervention. It can now be accessed via the [LGM website](#). Subsequent to the site going live, KCC have monitored ongoing usage from February 2016- August 2016. Data gathered from the site analytics showed very low levels of use for the Kent-specific site, hence it is unlikely to have contributed greatly to the overall impact of the LGM intervention.

The LGM intervention was quality-assured by coordinators who carried out monthly checks to ensure that the CEPs were following best practice.

3.3 Procedure

During the process of developing the project, KCC, ukactive engaged two GP surgeries from which the LGM intervention would run and recruit participants. Practices were chosen with a patient catchment from areas of highest deprivation

ukactive suggested the following criteria to help identify suitable surgeries:

- Approximately 25% of a surgery's list will meet the criteria (aged 18–75, BMI 28–35)

- To ensure value for money, surgeries that are expected to contribute fewer than 100 participants should not be engaged.

Limited resources and the current NHS landscape dictate that any initiatives designed for integration into a GP surgery must be flexible. The approach adopted by ukactive allows for input from surgery staff but also ensures that the programme can be delivered with very little of their involvement. In addition, it was suggested by ukactive that any surgery hosting LGM should:

- Have a system in place that allows for easy transfer of data, e.g. System1
- Allocate two hours of administrative time to setting up the programme
- Collect the names of people opting out within the 21-day opt-out period and ensure that these people's details are not passed to ukactive
- Supply contact information for lead and deputy safeguarding officials
- Have a room available for a minimum of eight hours per week for six months
- Fully brief their team on the programme (this briefing can be delivered by ukactive)
- Meet with the CEP prior to the date of the first appointments.

Targeting specific patients based upon GP records was the screening approach to recruiting for LGM as delivered by ukactive. ukactive consulted the Information Commissioner's Office and the Head of Information Governance at Public Health England to ensure appropriate safeguards and information governance were in place to deliver this service.

ukactive ensured that all data and records were protected and stored in line with national guidance and in accordance with Data Protection Act 1998. In addition, the Information Commissioner's Office, the Head of Information Governance at Public Health England, the local Clinical Commissioning Group (Caldicott Guardian) and Commissioning Support Unit's Head of Information Governance were informed of the process, and approval was granted. GP surgeries were encouraged to consult a professional legal service regarding any specific questions.

A data-transfer agreement was entered into between the GP surgeries and ukactive; clauses in the CEPs' contracts related to patient confidentiality; and non-disclosure agreements were signed between the CEPs and the GP surgeries.

To comply with the Data Protection Act 1998, GP surgeries were the only actors able to review patient lists and extract patient information. This involved reviewing patient records against the predefined criteria (age 18–75, BMI 28–35). ukactive supported the surgeries' communication with all patients who met the criteria by providing templates and data-extraction guides and funding the mail-out from the commissioned project budget.

Sufficient time (set by the ICO at 21 days) was given for participants to opt out following the receipt of a letter. After the opt-out period, the names, dates of birth and contact details of the patients who had not opted out were securely transferred to ukactive.

Ukactive secured permissions from the GP surgery to contact patients on their behalf and enrol them on the programme. Those contacted who did not wish to take part were not contacted by ukactive again. On arrival at the initial appointment, participants signed a consent form.

ukactive requested an ICO audit in October 2015. As part of this audit, the ICO reviewed the process used to extract patient data and found it to be fully compliant.

Stage 1

Practice managers downloaded a list of potential participants. From this list, ukactive sent letters to participants that matched the eligibility criteria:

- Aged 18+ years
- BMI >28
- No contraindications to managing a self-determined increase in physical activity (as defined by ukactive guidelines).

A ukactive coordinator (English- and Punjabi-speaking) made follow-up telephone calls to enquire about current levels of physical activity. If the participant was deemed suitable for the intervention, they were then invited to book an initial appointment. Coordinators are also trained in MI, and can use these techniques on the initial call to establish current levels of motivation and confidence. If participants declined the opportunity, their reason for doing so was recorded. Participants who booked an appointment received a reminder SMS and telephone call.

Stage 2

The initial 30-minute appointment was held in the patient's GP surgery. At this appointment, the CEP asked participants to complete the IPAQ measure, along with the importance and confidence questions. The participant then received the MI intervention as described in the section above, including discussing any pre-existing conditions with the CEP. The CEP also provided participants with a set of materials designed to support behaviour change over the 12-week period. These resources included an activity diary, goal-setting activities sheet, and the leaflet 'Maintaining a healthy weight'. Participants booked the 12-week appointment and were reminded that the CEP would follow up via telephone at six weeks. If the CEP felt that the participant might benefit from further support, additional telephone calls were made 1–2 weeks after the initial appointment.

Participants recruited from one GP surgery were also offered an appointment in which specific anthropometric measurements were taken (i.e. height and weight, blood pressure, and HbA1c levels via a blood test). The surgery phlebotomist gathered this data a week before or after the initial appointment. The CEP performed the follow-up appointment as part of the 12-week appointment.

Stage 3

At 6 weeks, participants received a telephone call (10–30 minutes, depending on individual needs) from the CEP, with a view to monitoring progress and offering support and advice. At

this point, where necessary, further MI was provided over the telephone, which afforded the opportunity to set a new plan and agree new goal(s). If the participant was on course to meet the original goals, the CEP provided further encouragement and ensured that the participant had all the practical information they needed to complete the planned physical activity.

Stage 4

The 12-week appointment was conducted face-to-face at the patient's GP surgery. The participant completed the IPAQ, confidence and importance measures. The CEP used this data as a tool to make comparisons and illustrate the change in physical activity levels. If the participant had not improved, further MI could be provided. The CEP discussed goals set at the initial appointment and longer-term goals were set. The CEP informed the participant that a ukactive coordinator would contact them in 6 and 12 months' time to gather follow-up information on physical activity. The appointment typically lasted 30 minutes.

Finally, the CEP distributed a ukactive feedback form to evaluate levels of satisfaction with LGM. The CEP also distributed invitations from researchers at the University of Kent to participate in a telephone interview. Interested participants were asked to return the expression of interest form in the supplied postage-paid envelope.

Stages 5 & 6

The LGM coordinators conducted the 6-month calls. Coordinators asked participants to complete the IPAQ and answer questions regarding confidence and importance. In addition, the CEP was able to note on the system anything they would like coordinators to ask at this stage, e.g. whether the participant was still attending a particular group. As the coordinators are also trained in MI, a brief intervention could be provided if it were felt that this would benefit the participant. The final stage is the 12-month follow-up, which replicates the same process as described for the 6 months.

Modifications to original intervention

Interventions are subject to unforeseen events that potentially change the form of delivery described in the protocol. This in itself is not necessarily problematic, but it is important to detail these adaptations in order to improve the reporting of interventions, as advised by the TiDieR checklist. In the event of modification, it is important to explain what was modified, why and when modifications occurred, and how the modified intervention differed from the original (Hoffman et al., 2014). Modifications can demonstrate new knowledge about the intervention, which it is important to share in order to prevent the unnecessary repetition of errors when attempts are made to replicate the intervention. Accordingly, ukactive provided details of all modifications made during the delivery of LGM:

- Some 12-week follow-up appointments were delayed for a few participants due to them being unable to make appointments and difficulty making contact.
- Initially, the phlebotomist at the GP surgery gathered the anthropometric measurements. However, as no participants required follow-up blood tests, this data could instead be collected by the CEP, who was trained to take blood pressure and weight measurements. Incorporating these measurements into the 12-week

appointments improved the implementation of this additional step. Prior to this, participants were required to attend a separate appointment, subject to availability at the GP surgery. This may have deterred participants from attending, due to the additional time commitment. In future iterations, consideration should be given to incorporating the collecting of these measurements into the CEP appointment. This would allow for a greater number to be carried out, ease pressure on the practice staff and offer a more convenient option for participants.

- Originally, two CEPs had been recruited to deliver the intervention – one for each GP surgery. After one CEP left mid-delivery, the decision was taken that the remaining CEP would take on these additional participants for the remainder of the intervention.

3.4 Design and Analysis

3.4.1 Quantitative data

The primary outcome of interest was improved physical activity levels, as assessed by MET (Metabolic Equivalent Task) minutes/week scores. Secondary outcomes were confidence to engage in physical activity and importance of physical activity. To assess the short-, medium- and long-term impact on the three outcomes, measures were taken at baseline, 12 weeks, and 6 months, with a final follow-up evaluation at 12 months still to come.

To explore the impact of LGM on physical activity, scores across the three time points were prepared in accordance with the IPAQ short form's scoring guidelines (2005). These guidelines recommend using the median (centre of the distribution) for analysis, due to non-normal distribution of scores. As a result, responses across time points were analysed using the Wilcoxon Signed Rank Sum Test.

Where appropriate, bivariate correlations (Spearman rho and Pearson's r) were also performed. This analysis explores whether the relationship between two variables (i.e. as one variable increases, the other also increases; or as one variable increases, the other variable decreases).

Results from all inferential statistical analyses were tested at the standard level of significance ($p < .05$). If a result is statistically significant (i.e. demonstrates a 'p' value lower than .05), it is unlikely to have occurred by chance and we can assume that the variables are either related (correlation) or demonstrate differences between the groups (t-tests).

For correlations, alongside a 'p' value, the analyses also produce an 'r' value, which represents the magnitude of the correlation (i.e. the strength of the relationship between the two variables of interest). Standard levels against which the 'r' is judged are as follows: .10 'small'; .30 'moderate'; .50 'large' (Cohen, 1988).

All analyses were conducted with SPSS (version 22).

3.4.2 Qualitative data

Interview guides for participants, GPs, CEPs, and practice managers were developed to explore the impact and implementation of LGM in more depth (Appendix 2). All interviews

were conducted via telephone, recorded and transcribed verbatim. Interviews typically lasted 30–45 minutes.

Data collected from all interviews was analysed using ‘Framework analysis’ (Ritchie & Lewis, 2003). This analysis involves five key stages: familiarisation; identifying a thematic framework; indexing; charting; mapping and interpretation. ‘Framework’ is particularly useful in applied research, as it allows pre-determined themes to be explored using more open and emerging categories. The overall thematic framework will allow commonalities to emerge and link the analysis to the quantitative study.

3.5 Participants

3.5.1 Initial contact

A stepped approach was adopted when recruiting participants to the intervention. This process is detailed below and illustrated in the LGM consort flow diagram (Figure 2). First, the practice manager downloaded a list of patients in each surgery who met the eligibility criteria of a BMI >28, age 18+ years and no reported contraindications (as defined by ukactive guidelines).

Letters were subsequently sent to a total of **3,030** patients (Surgery 1: n=1830; Surgery 2 n=1200), inviting them to take part in LGM and offering the opportunity to self-refer into the programme. The letters also gave patients a 21-day opt-out period – anyone opting out would be excluded from any further contact through the programme. Surgery 2 had a high number of patients of Asian or British Asian ethnicity, and so to mitigate any language barriers, the letters sent to these patients were written in both Punjabi and English.

From this sample, ukactive called **2,244** patients (Surgery 1: n=1702, 75.8%; Surgery 2: n=542, 24.2%) to book an initial appointment.² Just over half of this sample (55%) comprised female patients (n=1232), with male patients constituting 45% (n=1010). Those contacted ranged from 18–85 years, with a mean age of 50.6 (SD=14.80). Figure 1 displays the breakdown of age groups. The largest proportion of patients was aged 51–60 years (23.4%), followed by 41–50 years (21.8%) and 61–70 years (19.8%).

Figure 1 Breakdown of age groups for patients invited to book initial appointment

² The difference in numbers between letters sent and patients telephoned is due to a surgery having difficulties in transferring data to ukactive following the opt-out period. Consequently, despite the surgery sending over 1,200 letters, ukactive only received data for 475. In addition, after receiving the letter, patients had a three-week window in which to opt out of receiving a telephone call.

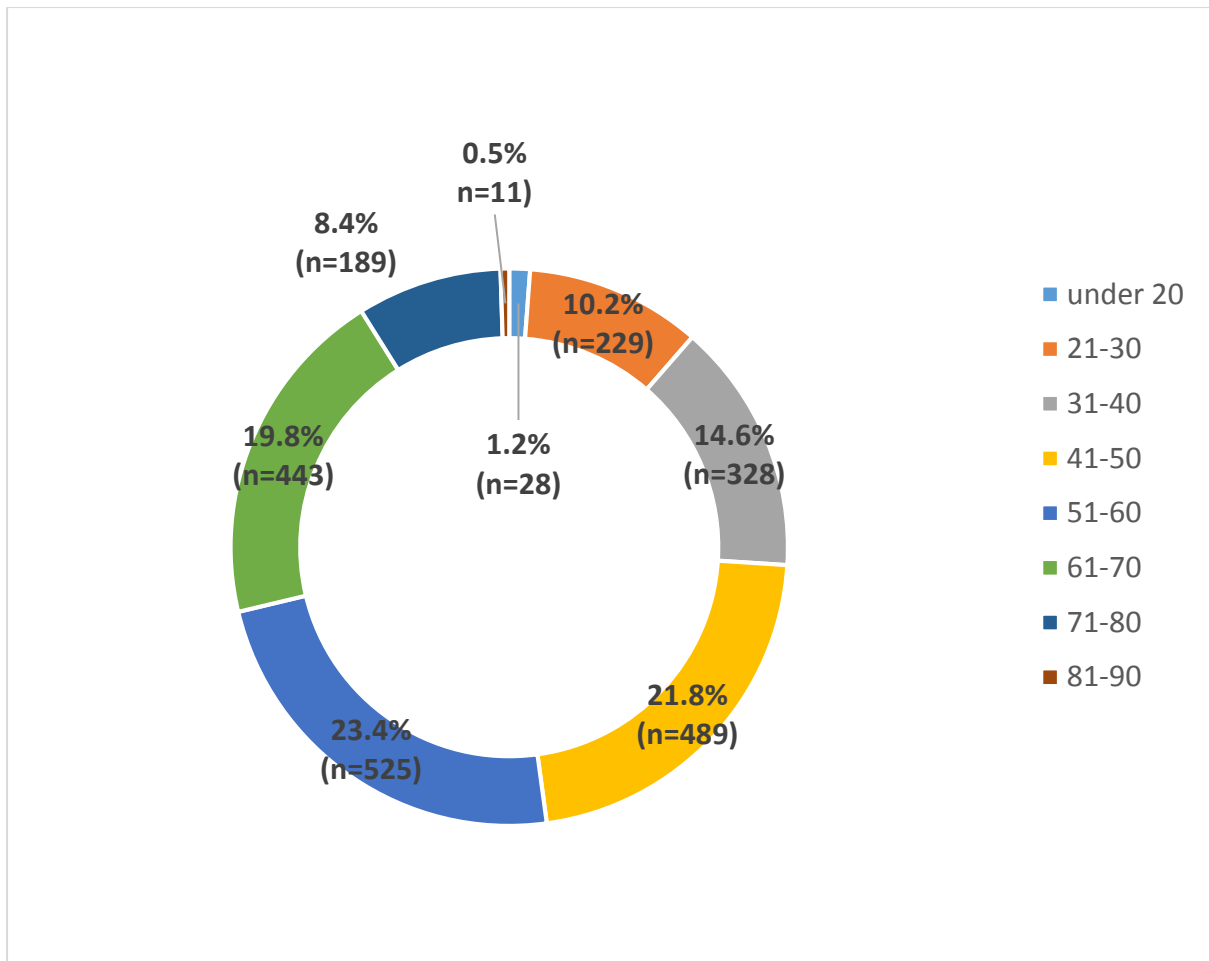
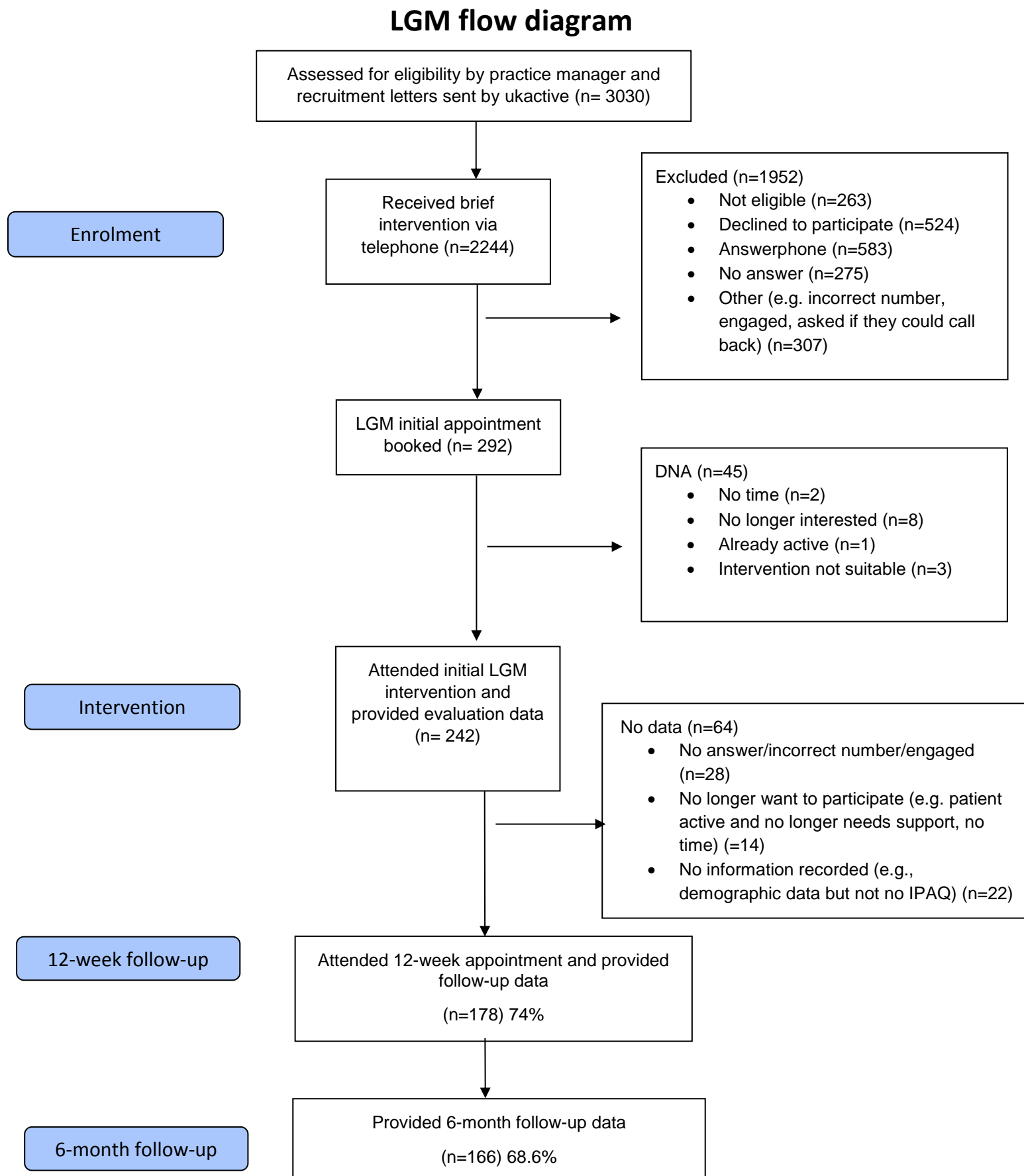
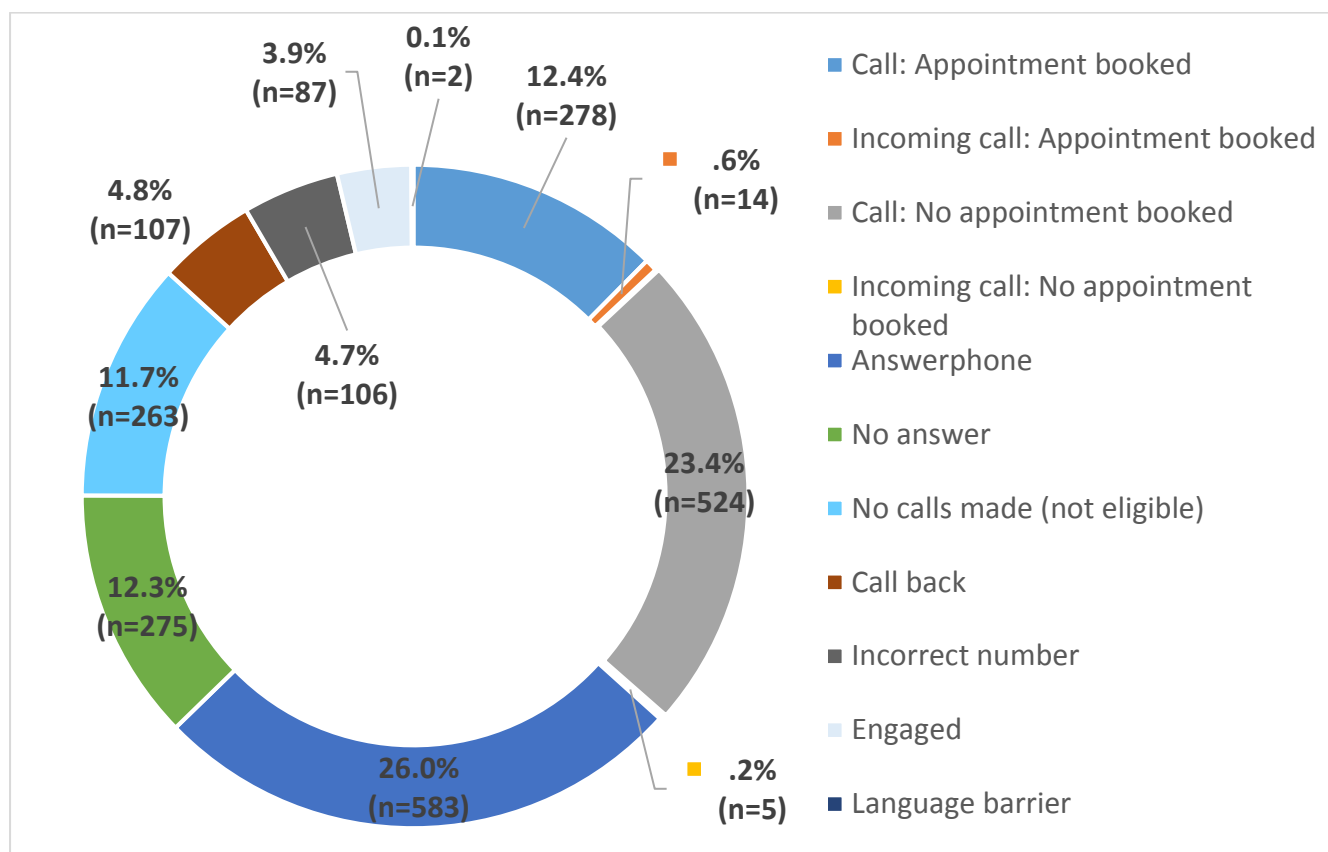


Figure 2 LGM consort recruitment flow diagram



Following the initial invitation letter to eligible patients, they were contacted by telephone, which involved screening for physical inactivity and a brief intervention. As a result of the telephone call, 13.0% (n=292, including n=14 patients who self-referred from an incoming call following the invitation letter) enrolled in the LGM intervention. 23.4% (n=524) left the programme. Patients who took the call, but did not book an appointment still received brief advice on physical activity (n=529). Figure 3 displays the full breakdown of outcomes from the brief advice and screening telephone call.

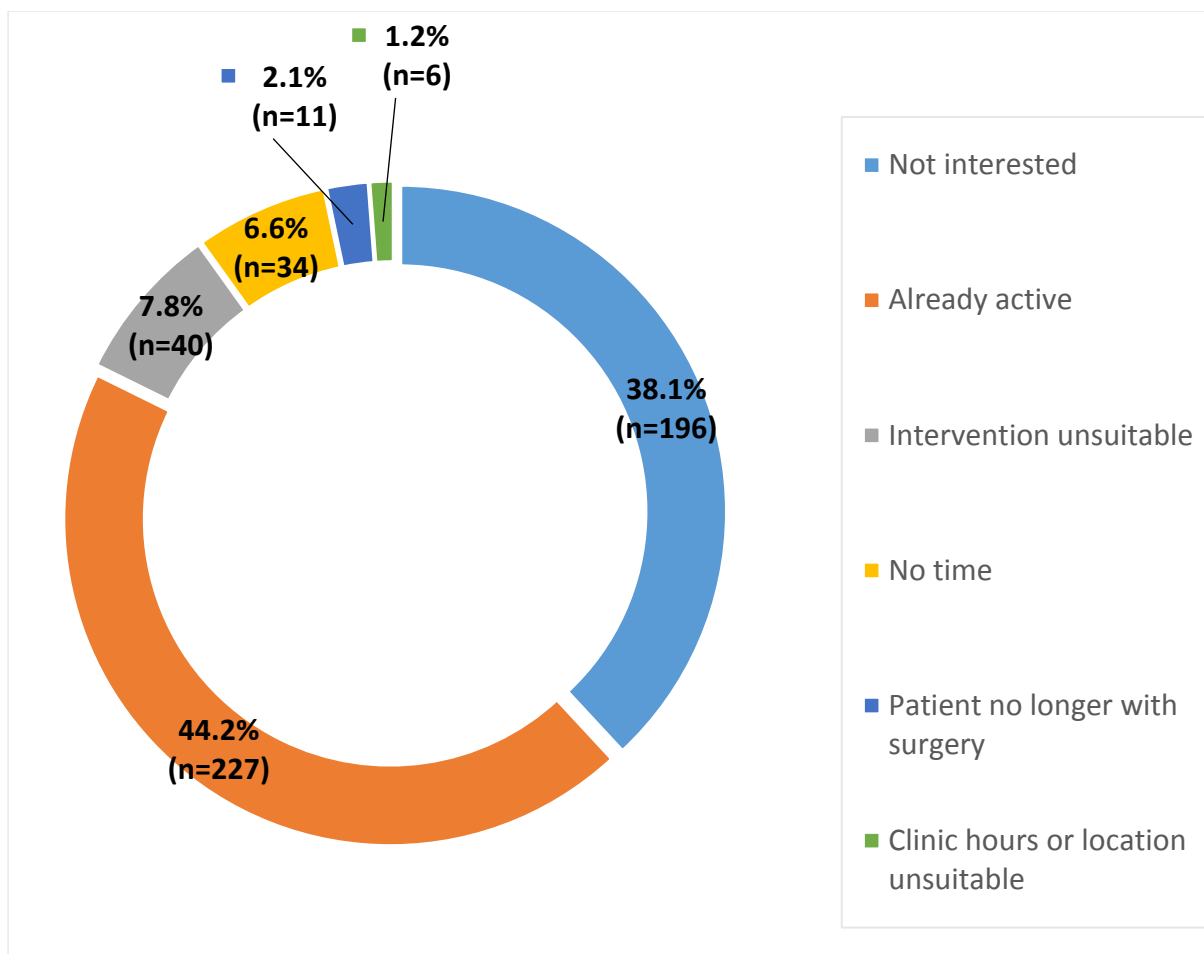
Figure 3 Breakdown of outcome from telephone intervention



As a follow-up, patients who left the programme without booking an appointment were asked why. In total, 514 patients provided a reason, with the largest proportion – 44.2% (n=227) – identified as ‘already active’, followed by 38.1% (n=196) reporting they were ‘not interested’ in the opportunity. Overall, only a small proportion (1.2%, n=6) reported that the surgery location or hours were unsuitable, which suggests that the use of GP surgeries as locations for health improvement services is acceptable to patients.

Figure 4 provides a full breakdown of the reasons why no appointment was booked.

Figure 4 Breakdown of why no appointment booked



3.5.2 Attendance at LGM appointment

As a result of the telephone call, a total of **292** patients booked an appointment, with **248** (84.9%) subsequently attending and providing demographic data. Of this sample, **242** also provided evaluation data (i.e. IPAQ, confidence, importance measures).³ Just over half of the sample – 53.2% (n=132) – were recruited from Surgery 1 and 46.8% (n=116) from the Surgery 2.

Gender

Of those who attended an appointment, 64.0% were female (n=158) and 36.0% male (n=89)⁴, which equates to a letter-to-attendance conversion rate of 12.8% for females and 8.8% for males. This suggests that recruiting for an intervention of this kind via GP surgeries was, to some extent, more appealing to females than males. Furthermore, considering females are typically less active compared to males throughout the course of their lives, it suggests that this is an effective method of engaging females and also provides evidence for best practice in relation to this group.

³ Of the 44 patients who did not attend, 14 provided a reason (No time (n=2); No longer interested (n=8); Intervention not suitable (n=3); Already active (n=1)). Six patients did attend the appointment but provided no IPAQ and/or confidence, importance data.

⁴ One participant did not provide gender information

Age

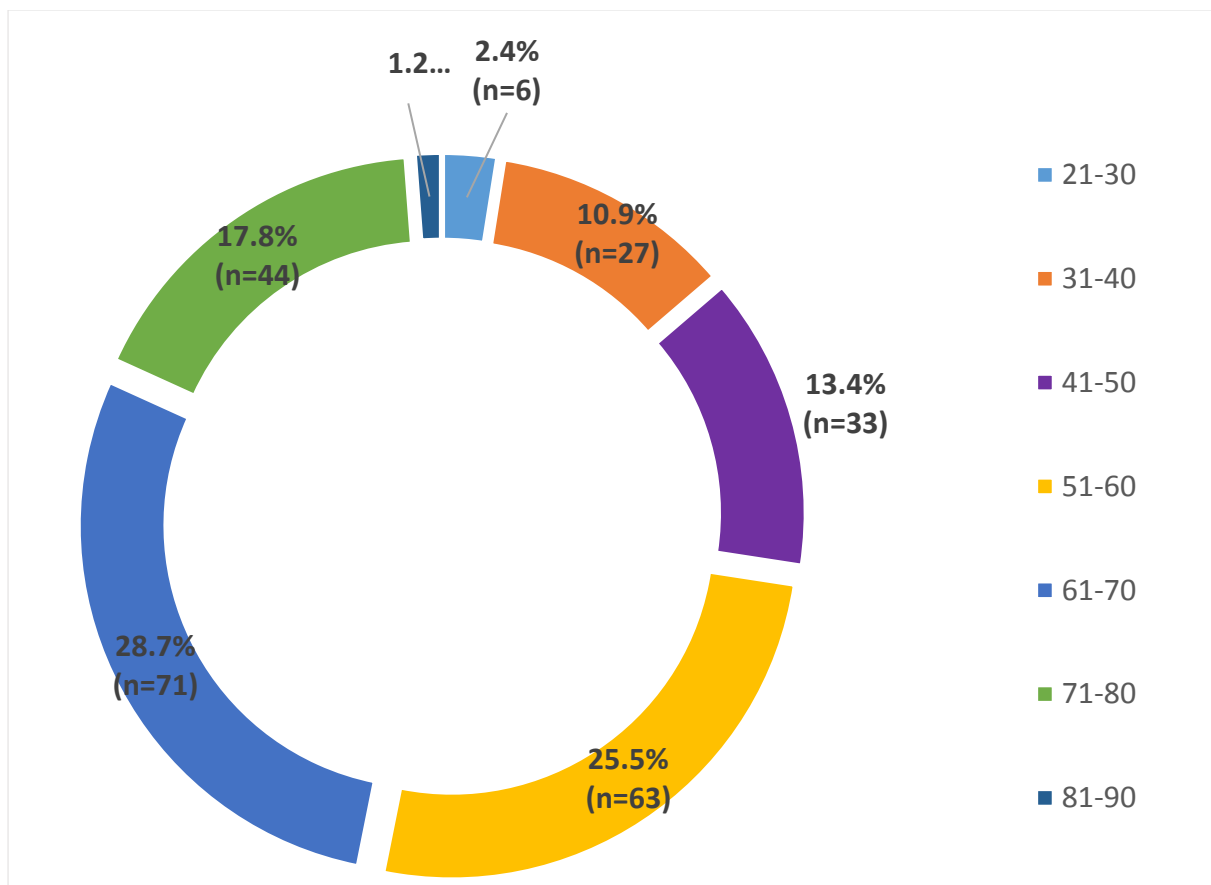
The age of participants ranged from 23–85 years, with a mean age of 58.16 (SD=13.12). The largest proportion of patients fell in the 61–70 years category (28.7%, n=71), followed by 51–60 years (25.5%, n=63) and 71–80 years (17.8%, n=44). The smallest proportions of patients were found at the extremes of the range, with only 2.4% (n=6) in 21–30 years and 1.2% (n=3) in the 81–90 years category.

Focusing on the letter-to-attendance conversion rates for each age group provides additional information. The older age groups' conversion rates were 23.2% (71–80); 27.0% (81–90); 16.0% (61–70); and 12.0% (51–60), while the rates in the younger age groups were relatively low, at 6.7% (41–50) and 8.2% (31–40).

Taken together, these results suggest that the LGM intervention appealed in particular to middle-aged people and older. This is noteworthy, as older adults typically become less physically active with age, and therefore constitute an important target group for this kind of intervention.

Figure 5 presents a full breakdown by age.

Figure 5 Breakdown of LGM participants by age category



The average age of females who participated in the programme was 55.75 years (SD=13.62), while the average age for males was slightly higher, at 62.43 (SD=11.33).

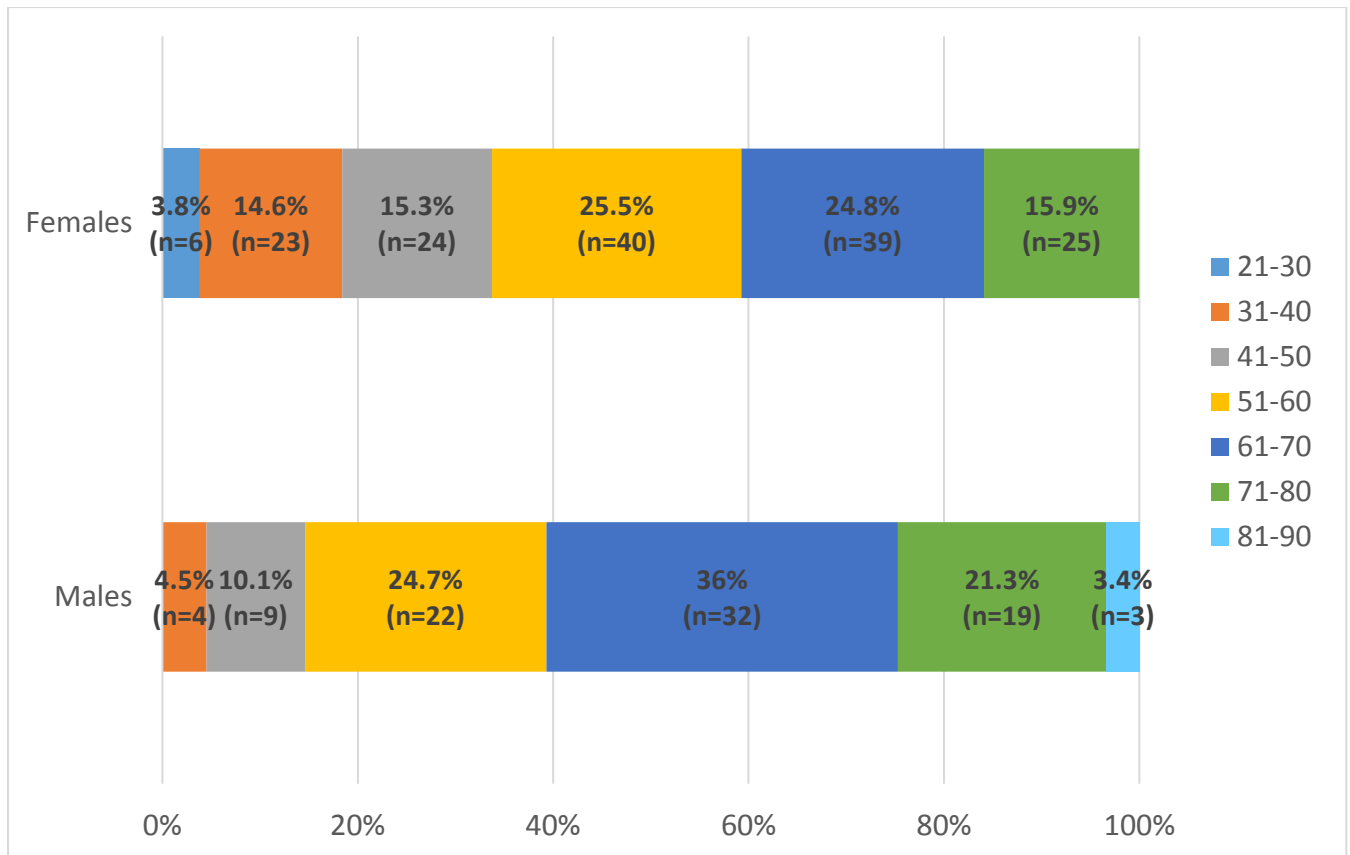
Within each gender, the largest proportion of participants were drawn from the 51–60 and 61–70 age groups.

Comparing proportions between the genders two key observations stand out. First, there was a larger proportion of males in the two older age groups (61-70 & 71-80), suggesting the programme appealed more to older males compared to females. Conversely, in the younger age groups (31-40 & 41-50), higher proportions of females were recruited, suggesting increased levels of engagement in mid-life females compared to males. Figure 6 shows the age x gender profile of the LGM participants

In summary, these results suggest that the LGM intervention appeals in particular to younger females and older males. It is difficult to reach any firm conclusions as to why this pattern emerged, as the evaluation did not ask participants to detail the reasons for engaging with LGM; however, looking at previous research on barriers and facilitators to physical activity participation may offer some explanation. For example, it may be that younger females feel more comfortable with a one-to-one approach, as typical gym-based environments can often be intimidating. Previous research has documented female discomfort in gyms as a contributory factor to non-attendance (Pridgeon & Grogan, 2012). By employing other facilities and resources, LGM may therefore have been seen as a preferable means of improving physical activity.

With regard to the smaller proportion of males in the younger age groups, the latest Sport England-funded Active People Survey (2015–2016) may offer an explanation. The survey highlighted that younger men are more likely than women to play sport, and as such may already be engaged in adequate levels of physical activity.

Figure 6 Age x gender of LGM participants

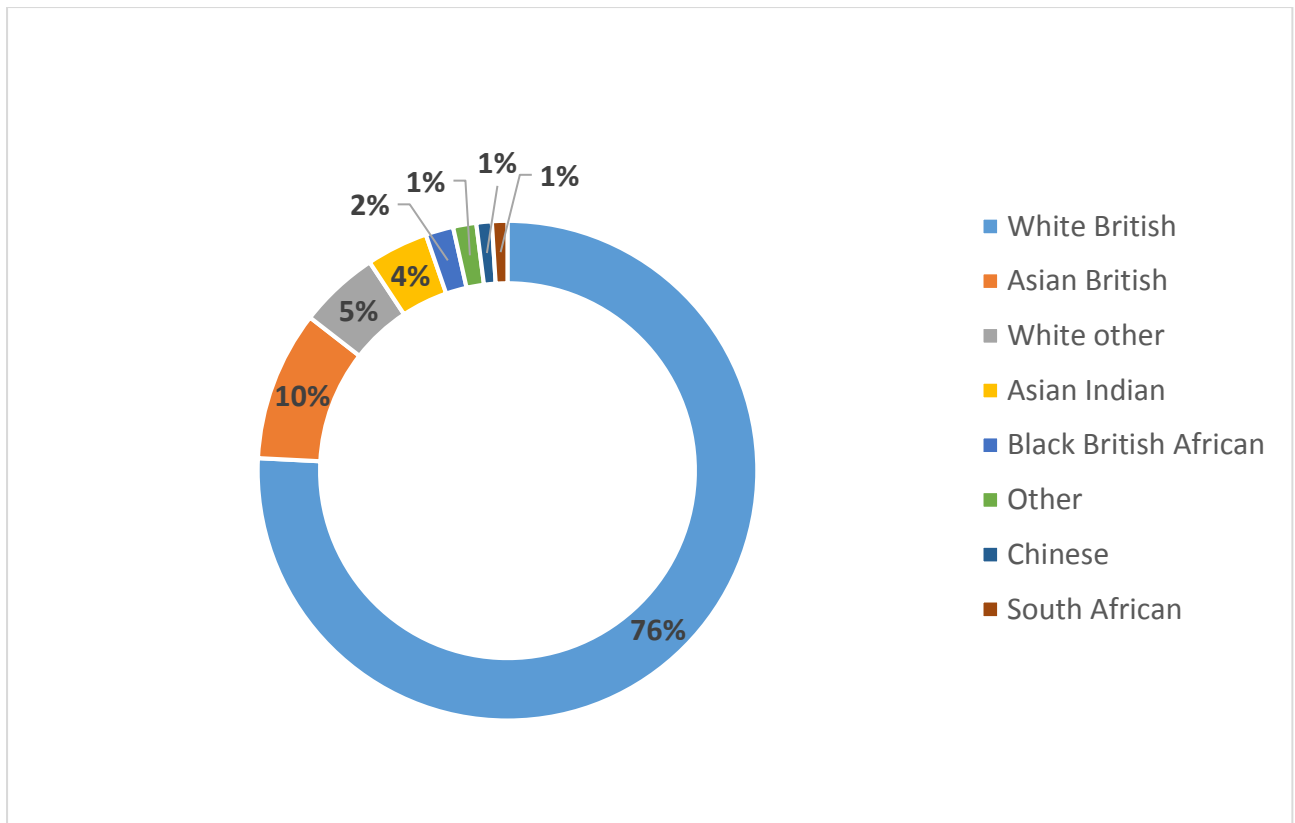


Ethnicity

The majority of participants identified themselves as 'white British' (75.8%, n=172). The second largest proportion was 'Asian British' (9.7%, n=22). All participants who identified themselves as 'Asian Indian' or 'Asian British' were recruited from Surgery 2.

Adaptations were made to the standard LGM intervention to reflect the relatively high Asian population in the catchment area for Surgery 2 (i.e. a recruitment letter translated into Punjabi and the recruitment of a Punjabi-speaking CEP and coordinator). This resulted in 27.2% (n=31) of the sample identifying themselves as Asian. This compares favourably with the overall percentage residing in the catchment area of 9.3%. However, we do not have the GP surgery's ethnicity profile, so we are unable to make firm conclusions regarding the impact of these adaptations on recruitment. Figure 7 shows the overall ethnicity breakdown.

Figure 7 Ethnicity breakdown for participants

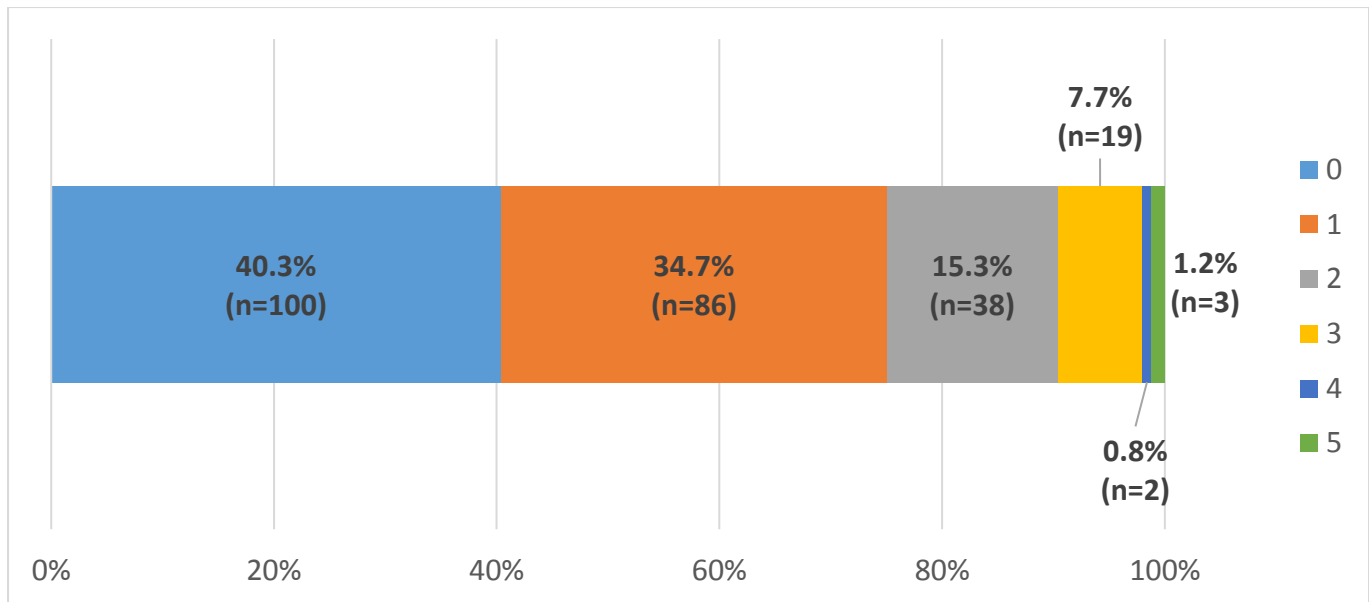


Health conditions including disability and long-term conditions

Overall, 59.7% (n=148) of participants indicated that they had an underlying health condition, while 40.3% (n=100) reported none. The number of different types of health conditions reported ranged from 0–5 (Mean = 1.00, SD= 1.06). Figure 8 shows that just over a third – 34.7% (n=86) – reported one health condition, while 25.0% (n=62) reported multiple health concerns.

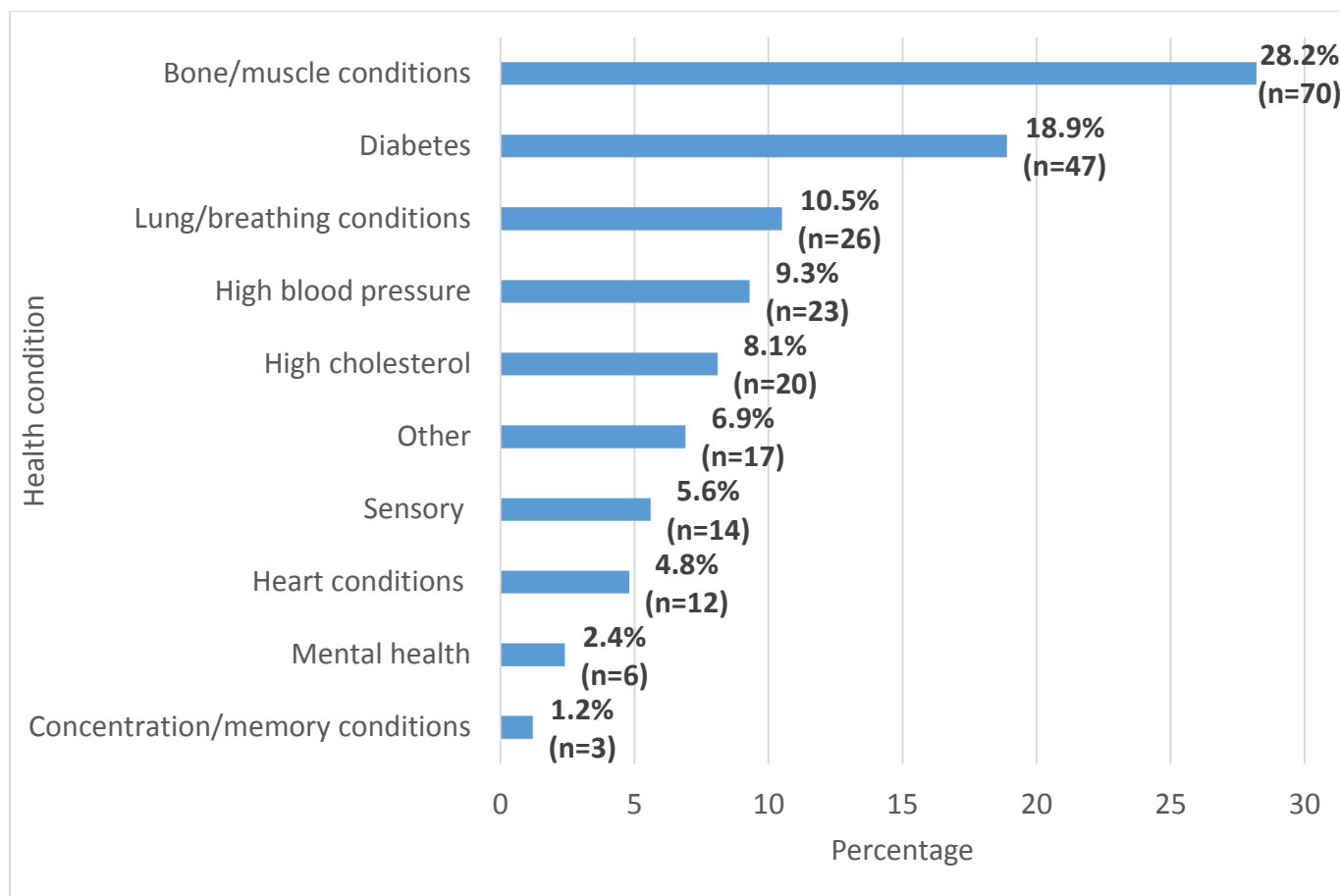
Taken together, these results suggest that the LGM intervention was an effective method of recruiting individuals with underlying health conditions and disabilities. These are ‘high value’ individuals, who may not be able to participate in mainstream sport, but who may have felt that the LGM intervention offered them an opportunity to gradually improve their level of physical activity and a protected space in which to do so.

Figure 8 Breakdown for number of disabilities & long-term health conditions



Of the health conditions reported, the majority can be managed and/or improved by engaging in physical activity, which again demonstrates that the intervention is successful at targeting a key demographic. With regard to the proportions across conditions, the most commonly cited were bone/muscle conditions (e.g. arthritis, back pain, muscle strains), at 28.2% (n=70), followed by diabetes 18.9% (n=47), lung/breathing conditions (e.g. COPD, asthma) 10.5% (n=26), and high blood pressure 9.3% (n=23). A small proportion (6.9%, n=17) reported 'other' conditions, including underactive thyroid, autism, Lyme disease, vertigo and Crohn's disease. Figure 9 presents the full breakdown for all reported health conditions.

Figure 9 Breakdown per health condition



3.6 Ethics

Service evaluations do not normally require NHS ethical approval. However, in relation to the introduction of blood tests at one of the GP surgeries, it was advised that an application should be made. Accordingly, ethical approval for the evaluation was gained from the NHS NRES London-Bromley committee (15/LO/1590) on 02/09/2015, alongside institutional approval from the University of Kent. In addition, R&D approval and a Letter of Access were obtained from both GP surgeries. Participants were treated in accordance with the ethical guidelines issued by the NHS and the University of Kent.

4. Results

4.1 Quantitative data

4.1.1 Physical activity

Data Preparation

IPAQ data was prepared for analysis in accordance with the scoring guidelines for the short-form IPAQ (2005). First, the data was recoded to reflect the recommended minimum and maximum values. Accordingly, activity of less than 10 minutes was recoded to 0, while any reported activity above 180 minutes was recoded using 180 as a maximum value.

Responses on the IPAQ are converted to MET values (Metabolic Equivalent Task). MET is a standardised and accepted measure of physical activity, in which the calculation takes into account the intensity of an activity while also allowing for comparison of energy expenditure among individuals of different weight. IPAQ uses the standard MET codes, as published in the ACSM's *Guidelines for Exercise Testing and Prescription* (2013).

MET-minutes/week for each type of activity – vigorous, moderate, and walking – are calculated using the standardised formula below:

- Walking MET-minutes/week = 3.3 x walking minutes x walking days
- Moderate MET-minutes/week = 4.0 x moderate minutes x moderate days
- Vigorous MET-minutes/week = 8.0 x vigorous minutes x vigorous days

This score measures the volume of activity by weighting each type of activity by its specific energy requirements as defined in METS (multiples of the resting metabolic rate) to yield a score in MET-minutes.

These calculations provide a MET-minute/week score for each activity and can also be combined to form a 'total physical activity MET-minutes/week' score. Higher scores equate to higher levels of physical activity.

The total for each individual is subsequently categorised into one of three groups: low, moderate or high. The parameters for each group were as follows:

1) Low

- Individuals who did not meet the criteria for moderate or high

2) Moderate

- Total physical activity of at least 600 MET-minutes/week, made up of:
 - At least 20 minutes of vigorous intensity activity per day for three or more days per week OR
 - At least 30 minutes of moderate intensity activity per day for five or more days per week OR
 - Five or more days of any combination of walking, moderate-intensity or vigorous-intensity activities.

3) High

- Vigorous-intensity activity on at least three days, achieving a minimum total physical activity of at least 1,500 MET-minutes/week OR
- Five or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum total physical activity of at least 3,000 MET-minutes/week.

The IPAQ scoring guidelines recommend using the median (centre of the distribution) for analysis, due to non-normal distribution of scores. For the purpose of this report, both median and mean values will be reported for descriptive statistics, while the median alone will be used for comparisons.

Baseline descriptive statistics

At baseline, n=240 participants provided IPAQ data. Table 1 below summarises the descriptive statistics for each type of activity and total physical activity.

Table 1 Descriptive statistics for baseline IPAQ

Activity	Mean	Median	SD	Range
Walking	480.92	198.00	749.90	0–4158
Moderate	365.20	0	787.30	0–5040
Vigorous	198.33	0	1103.90	0–10080
Total activity	1044.45	410.00	1985.36	0–16524

In terms of overall physical activity groups, 62.1% (n=149) of participants were classified as 'low' physical activity, 30.4% (n=73) as 'moderate', and 7.5% (n=18) as 'high'.

12-week descriptive statistics

At 12 weeks, n=173⁵ participants provided IPAQ data⁶. Table 2 below summarises the descriptive statistics for each type of activity and total physical activity.

Table 2 Descriptive statistics for 12-week IPAQ

Activity	Mean	Median	SD	Range
Walking	741.12	445.50	870.26	0–4158
Moderate	678.03	300.00	992.39	0–5040
Vigorous	546.41	0	1646.07	0–10080
Total activity	1720.72	1038.00	2251.57	0–16524

⁵ 5 participants attended the appointment and provided confidence & importance data but no IPAQ hence the 173 number.

Compared to baseline, there was a positive shift in the proportion of individuals categorised as 'low' from 62.1% to 30.6% (n=53). Positive changes were also noted in the proportion of individuals classified as 'moderate' (increasing from 30.4% to 52.0% (n=90)) and in the proportion classified as 'high' (from 7.5% to 17.3% (n=30)).

6-month descriptive statistics

At 6 months, n= 166 participants provided IPAQ data. Table 3 below summarises the descriptive statistics for each type of activity and total physical activity.

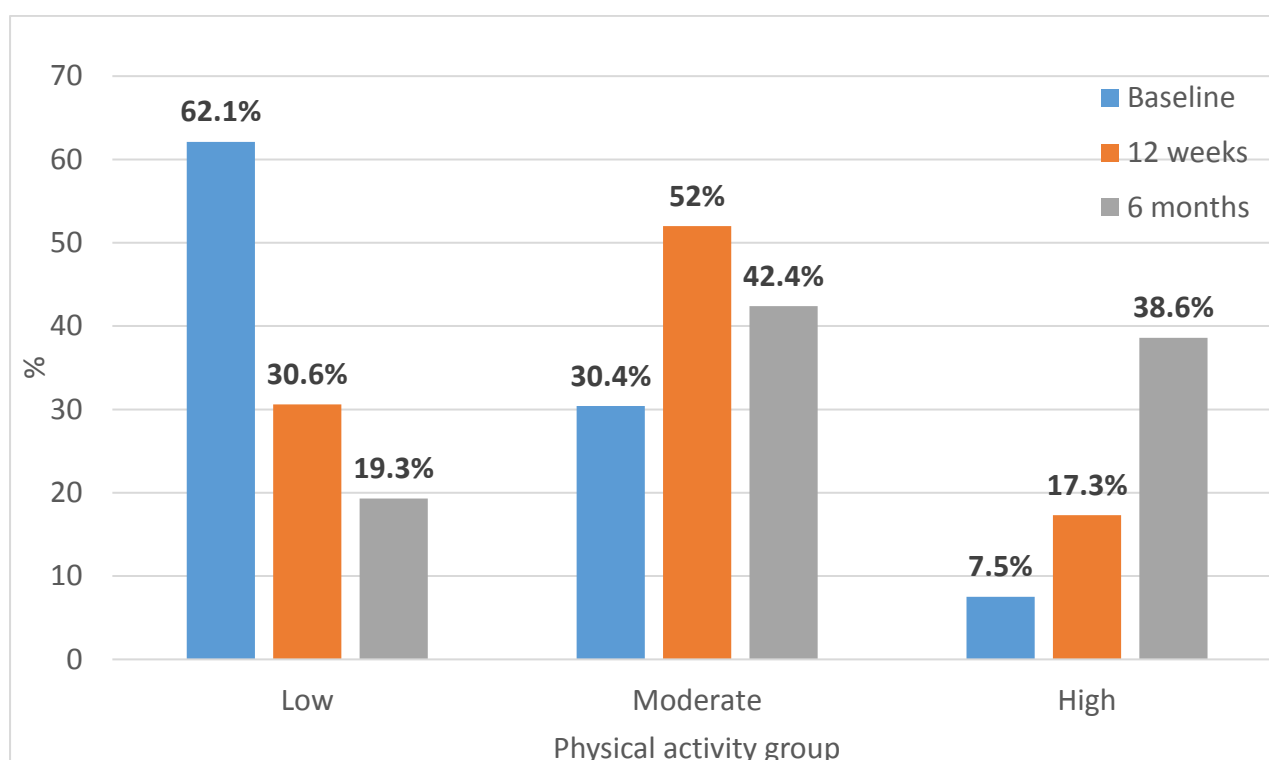
Table 3 Descriptive statistics for 6-month IPAQ

Activity	Mean	Median	SD	Range
Walking	740.52	462.00	853.85	0 - 4158
Moderate	1281.93	840.00	1339.13	0 - 5040
Vigorous	485.54	0	1125.48	0 - 10080
Total activity	2507.99	1934.00	2296.88	0 - 19278

In terms of physical activity groups, compared to baseline results, again we see a decrease in the proportion of individuals categorised as 'low' to 19.3% (n=32) and 'moderate' to 42.2% (n=70), while the proportion for 'high' increased to 38.6% (n=64).

Figure (10) illustrates the proportion of participants in each physical activity group across three time points.

Figure 10 Proportion of participants in each activity group at baseline, 12 weeks, and 6 months.



Impact of LGM on physical activity

Degree of change in physical activity

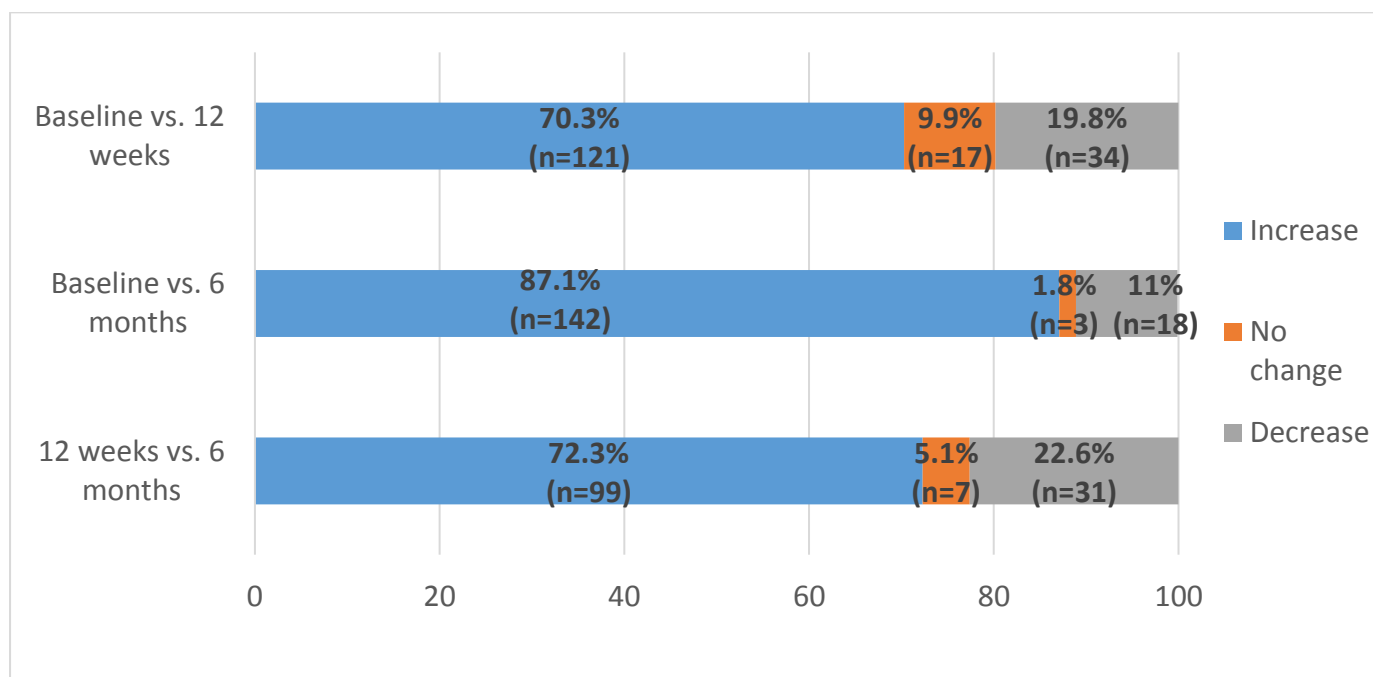
A score was calculated to assess the degree of change in physical activity levels from baseline. A positive change score is indicative of an increase in physical activity, while a negative change score indicates a decrease.

For those individuals who returned for the 12-week and 6-month appointments, the mean degree of change in total physical activity was in a positive direction at both **12 weeks (625.18 MET (SD = 1902.15, range = -9239–11733))** and at **6 months (1421.09 MET (SD= 2056.12, range = -85662–7878))**. This suggests an overall increase from baseline in the amount of physical activity undertaken.

To support this finding, **70.3% (n=121)** of the participants who returned at 12 weeks (n=172) reported a **positive change** in total physical activity, rising to **87.1% (n=142)** in the sample of participants who returned **at 6 months** (n=163).

Figure 11 summarises the proportion of individuals who reported increased, stable or decreased levels of total physical activity across the three time points.

Figure 11 Change in physical activity levels from baseline vs. 12 weeks and 6 months



The change score also provides insight in to the medium-to-longer-term impacts of the intervention. This can be achieved by exploring the movement of participants within the three change groups – increase, no change, and decrease – across the three time points.

134 participants provided IPAQ data for all three time points, which facilitates analysis over the entire period.⁷

Of the 92 participants who reported an increase in physical activity at 12 weeks and provided 6 month follow-up data, 64.1% (n=59) reported further increases in physical activity between 12 and 6 months, 4.3% (n=4) indicated no change and 31.5% (n=29) reported a decrease. This suggests that the majority of participants who initially increased their level of physical activity were able to further improve or maintain this level of behaviour change at 6 months.

Of the 14 participants who reported no change in the level of physical activity at 12 weeks, 71.4% (n=10) reported an increase at 6 months, 21.4% (n=3) remained stable, and one person reported a decrease.

Finally, 96.7% (n=29) of participants who reported a decrease at 12 weeks compared to baseline subsequently changed their behaviour and reported a positive change between 12 weeks and 6 months.

Gender

To explore potential differences in degree of change between males and females a one-way ANOVA was conducted.⁸ Results revealed no significant differences between males and females in the extent to which total physical activity levels changed from baseline to 12 weeks ($p=.60$), baseline to 6 months ($p=.21$) and 12 weeks to 6 months ($p=.23$). This suggests the LGM intervention had a similar impact across the genders.

Age

Pearson correlations were conducted to explore the relationship between age and degree of change in total physical activity. There was no significant relationship between age and degree of change from baseline to 12 weeks ($r = -.02$, $p=.78$), baseline to 6 months ($r = -.08$, $p=.33$), 12 weeks to 6 months ($r = -.07$, $p=.44$). This suggests the change in physical activity was not influenced by age of participants.

Health conditions including disability and long-term conditions

Pearson correlations were also conducted to explore the relationship between number of co-morbid health conditions and degree of change in total physical activity. There was no significant relationship between number of health conditions and degree of change from baseline to 12 weeks ($r = -.06$, $p=.44$), baseline to 6 months ($r = -.08$, $p=.34$), 12 weeks to 6 months ($r = -.01$, $p=.94$). This suggests the programme has similar effects in individuals with none and multiple co-morbid long-term conditions, and that there is no reduction in patient outcomes from the programme with increasing disease burden.

⁷ Although we have data for 166 participants at 6 months, 29 participants did not provide either baseline or 12-week data and therefore cannot be used in this analysis.

⁸ In contrast to the raw physical activity data, degree of change data were normally distributed hence the use of a parametric test.

How physical activity increased

To further understand how the types of physical activity contributed towards improvement, the data was broken down by activity type – walking, moderate, and vigorous – for participants who reported an increase in activity at 12 weeks (n=121) and at 6 months (n=142).

At 12 weeks, of the 121 participants whose physical activity improved, 24.0% (n=29) reported an increase in vigorous activity, 65.3% (n=79) in moderate activity and 75.2% (n=91) in walking. This suggests that the uptake in physical activity at 12 weeks was generally due to increased walking and moderate activity.

At 6 months, of the 142 participants who reported an increase in physical activity from baseline, vigorous activity contributed in 42.3% (n=60), moderate activity in 82.4% (n=117) and walking in 66.2% (n=94). Again, although the proportion of participants engaging in vigorous activity increased from 12 weeks, the leading contributions to improvements in physical activity remain moderate activity and walking.

This conclusion is supported in part by an analysis of the patient notes taken by the CEP, in which the different types of activities recommended were recorded. ukactive shared a number of notes made at the initial appointment. Notes pertaining to 65 participants were shared, 48 of which included a specific activity goal set by the CEP. The most common goal was 'increase walking' (n=25), followed by 'joining an activity class (n=12), 'strengthening exercises' (n=7), and 'cycling' (n=5). Other activities mentioned less frequently included chair-based exercises, attending a gym, exercising at home, swimming and running.

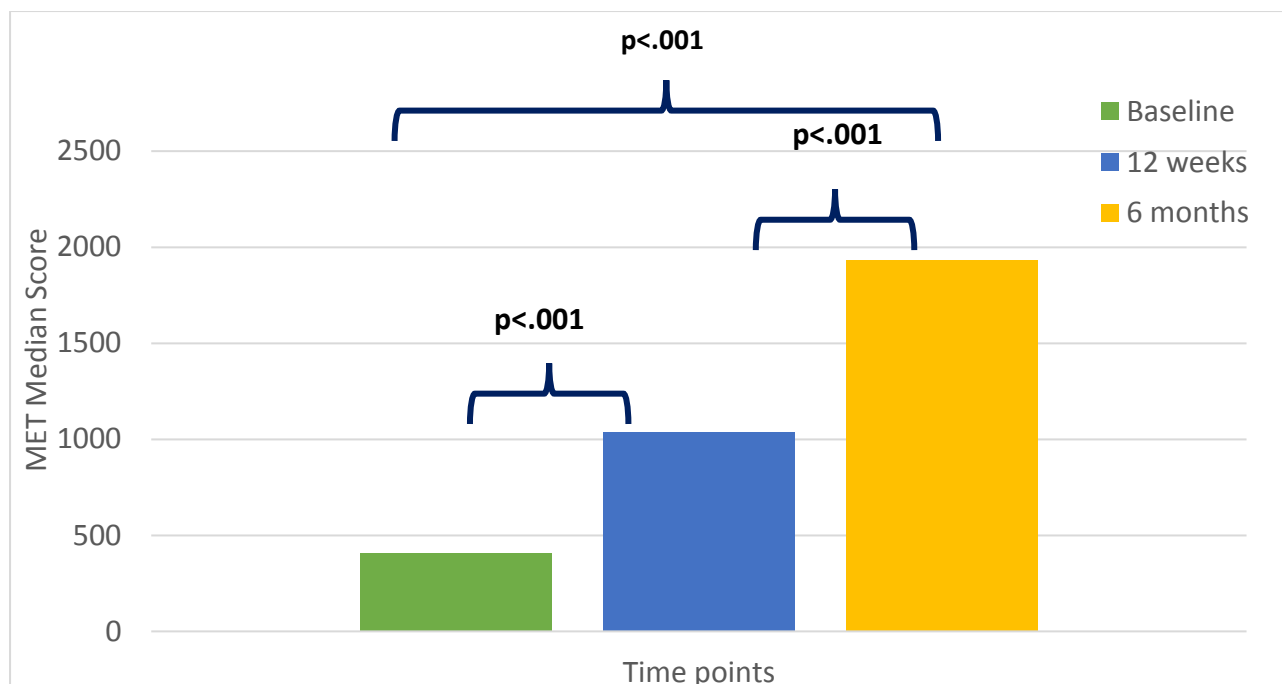
Comparison of physical activity levels across time points

Baseline data for walking, moderate, vigorous and total physical activity were compared with 12-week and 6-month data. The distribution of the data was non-normal, hence a Wilcoxon Signed Rank Sum Test was used to explore statistically significant differences between the three time points.

Total physical activity

For total physical activity levels, the data suggests a statistically significant positive change from baseline (Mdn = 410.00) to 12 weeks (Mdn = 1038.00), $T = 2399$, $p < .001$, and baseline to 6 months (Mdn = 1934.00), $T = 1406$, $p < .001$. In addition, a positive change in physical activity from 12 weeks to 6 months was also noted, $T = 1682$, $p < .001$. This data is displayed in Figure 12.

Figure 12 Median values for total physical activity baseline, 12 weeks & 6 months



Gender

The results for total physical activity replicated those observed for the whole study population, with both males and females noting a significant increase in total activity at baseline vs. 12 weeks ($p < .001$), at baseline vs. 6 months ($p < .001$), and at 12 weeks vs. 6 months ($p < .001$). This suggests that the impact of the LGM intervention on total activity was equivalent for both males and females.

Age

Spearman's rho correlations were conducted to explore the relationship between age and total physical activity levels⁹. There was no significant correlation between age and total activity at baseline ($r_{s=}$.01, $p=$.89), 12 weeks, ($r_{s=}$.01, $p=$.89) and 6 months ($r_{s=}$ -.05, $p=$.55).

Potential differences in impact according to age groups was also investigated by dividing participants into three age groups: 18–40 years ($n=$ 33), 41–60 years ($n=$ 96) and 61–80 years ($n=$ 115).¹⁰

Across all three age groups, a significant increase in total physical activity was observed at 12 weeks and 6 months, reiterating that the intervention had a similar impact across all age groups.

Health conditions including disability and long-term conditions

The impact on total physical activity levels was explored through a number of analyses. First, a Spearman's rho correlation demonstrated a significant negative correlation between

⁹ Non parametric test due to positive skew of physical activity data.

¹⁰ Three participants were above 80 years, but as this group was too small to provide any meaningful conclusions, these individuals have been excluded from the analysis.

number of co-morbid health conditions or disabilities and the amount of physical activity at 12 weeks ($r_s = -.17$, $p = .03$). This suggests that individuals who report higher numbers of co-morbid health conditions, also engaged in lower levels of physical activity at 12 weeks. However at 6 months there was no significant relationship between the two variables suggesting co-morbid conditions were less influential at this later time point ($r_s = -.13$, $p = .08$).

GP surgery

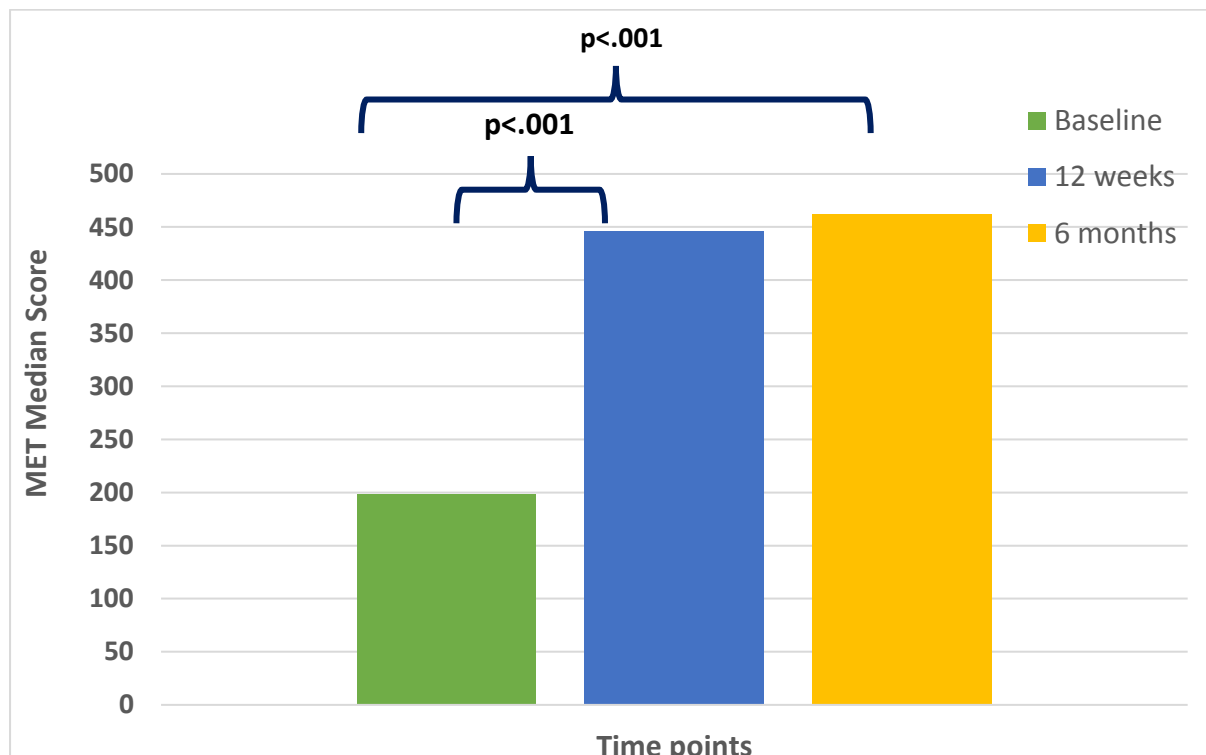
Again, the results for total physical activity broken down by GP surgery replicated those observed for the whole study population, with participants at both sites noting a significant increase in total activity at baseline vs. week 12 ($p < .001$), at baseline vs. 6 months ($p < .001$) and at 12 weeks vs. 6 months ($p < .001$). This suggests that the impact of the LGM intervention on total activity did not differ according to recruitment site.

Walking

Looking first at the changes in walking, a statistically significant increase in walking was observed from baseline (Mdn = 198.00) to 12 weeks (Mdn = 445.50), $T = 2017$, $p < .001$. This pattern of results continued with another significant increase for baseline vs. 6 months (Mdn = 462.00), $T = 2239.50$, $p < .001$.

There was no significant change in levels of walking from 12 weeks to 6 months ($p = .09$). The median values are displayed in Figure 13.

Figure 13 Median values for walking at baseline, 12 weeks & 6 months



Gender

The Wilcoxon Signed Rank Sum Test was again conducted to explore whether the spread of results differed according to gender.

The results replicated those observed for the whole study population, with both males and females noting a significant increase in walking activity at baseline vs. 12 weeks ($p<.001$) and baseline vs. 6 months ($p<.001$), but not at 12 weeks vs. 6 months. This result suggests that the impact of the LGM intervention on walking was equivalent for both males and females.

Age

In the 18–40 age group, a pattern emerged that differed from that observed for the whole population. There was no significant improvement in levels of walking at 12 weeks or 6 months compared to baseline levels.¹¹

In the two older age groups, the pattern of results replicated that of the whole population, with significant improvements in levels of walking observed at 12 weeks ($p=.001$) and 6 months ($p=.001$) compared to baseline.

GP surgery

No differences between the sites were noted, with individuals across both sites noting a significant increase in walking at baseline vs. 12 weeks ($p<.001$) and baseline vs. 6 months ($p<.001$), but not at 12 weeks vs. 6 months ($p= n/s$).

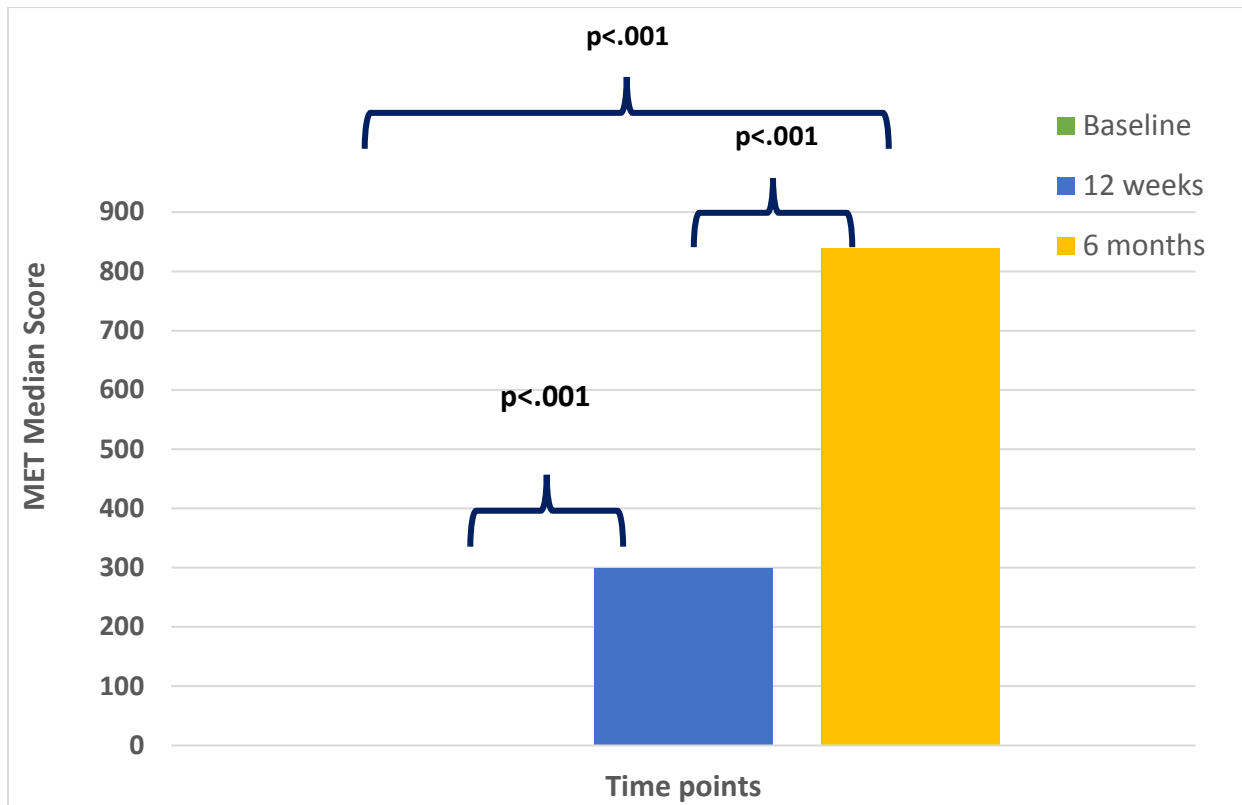
Moderate activity

With regard to moderate activity, a statistically significant increase was noted at 12 weeks (Mdn = 300.00) and at 6 months (Mdn= 840.00), $T= 1241$, $p<001$) compared to baseline (Mdn = 0, $T= 1444$, $p<001$). There was also a significant positive change between 12 weeks and 6 months ($T= 1452$, $p<.001$). Taken together, the results suggest the LGM intervention is effective at improving levels of moderate activity in both the short and medium term.

The median values are displayed in Figure 14.

¹¹ The result may be influenced by the relatively small sample sizes across the three time points: 32 at baseline; 16 at 12 weeks; 11 at 6 months.

Figure 14 Median values for moderate activity at baseline, 12 weeks & 6 months



Gender

Again, results replicated those observed for the whole study population, with both males and females noting a significant increase in moderate activity at baseline vs. week 12 ($p < .001$), baseline vs. 6 months ($p < .001$) and at 12 weeks vs. 6 months ($p = .001$). This suggests that the impact of the LGM intervention on moderate activity was equivalent across males and females.

Age

Looking at age, the pattern across the groups broadly replicated that of the whole sample, i.e. significant improvements in moderate activity at 12 weeks and 6 months compared to baseline and between 12 weeks and 6 months. The only different result was in the 18-40 age group, in which no significant improvement was observed between 12 weeks and 6 months.

GP surgery

Results for moderate activity replicated those observed for the whole study population, with individuals across both sites noting a significant increase in moderate activity at baseline vs. week 12 ($p < .001$), baseline vs. 6 months ($p < .001$) and at 12 weeks vs. 6 months ($p < .001$).

Vigorous physical activity

Like other activity types, vigorous activity also significantly increased from baseline at 12 weeks, $T = 155$, $p < .001$, and 6 months, $T = 287$, $p < .001$. A significant difference was also observed between vigorous activity levels at 12 weeks vs. 6 months ($p < .05$).

Gender

Differences in the pattern of results according to gender were observed for vigorous activity. In contrast to the whole population, levels of vigorous activity did not change significantly for male participants at 12 weeks vs. baseline ($p = .09$ n/s), at 6 months vs. baseline ($p = .09$ n/s) or at 12 weeks vs. 6 months ($p = .88$ n/s). However, significant differences were observed for baseline vs. 12 weeks and baseline vs. 6 months for female participants, suggesting that the noted improvement in vigorous activity is predominately among this group of participants.

Age

Differences in the pattern of results according to age also emerged for this type of activity. In the 18–40 group, a gradual, continued significant improvement in levels of vigorous activity was observed at both 12 weeks and 6 months. By contrast, individuals in the 41–60 group took longer to improve levels of vigorous activity, with no initial change at 12 weeks, but significant improvements were noted at 6 months ($p < .001$). Finally, the 61–80 group made positive changes sooner than the younger group, with a significant uptake noted at 12 weeks ($p = .001$). This improvement was also maintained at 6 months ($p = .001$). There was no significant difference in levels of vigorous activity between 12 weeks and 6 months. This pattern of results suggests that changes in behaviour were generally initiated in the first 12 weeks of the intervention, with the increased levels of activity subsequently maintained throughout the following weeks.

GP surgery

The results for vigorous activity replicated those observed for the whole study population, with individuals at both sites noting a significant increase in vigorous activity at baseline vs. 12 weeks (Surgery 2: $p < .001$, Surgery 1: $p < .05$) and baseline vs. 6 months ($p < .001$), but not at 12 weeks vs. 6 months.

4.1.2 Confidence and importance

At baseline, $n = 207$ participants completed the confidence ($M=6.44$, $SD= 1.89$, range =1–10) and importance measures ($M= 8.47$, $SD= 1.49$, range =1–10). At 12 weeks, $n=109$ participants provided confidence ($M=8.16$, $SD= 1.47$, range =2–10) and importance data ($M=9.14$, $SD= 1.29$, range = 4–10).¹²

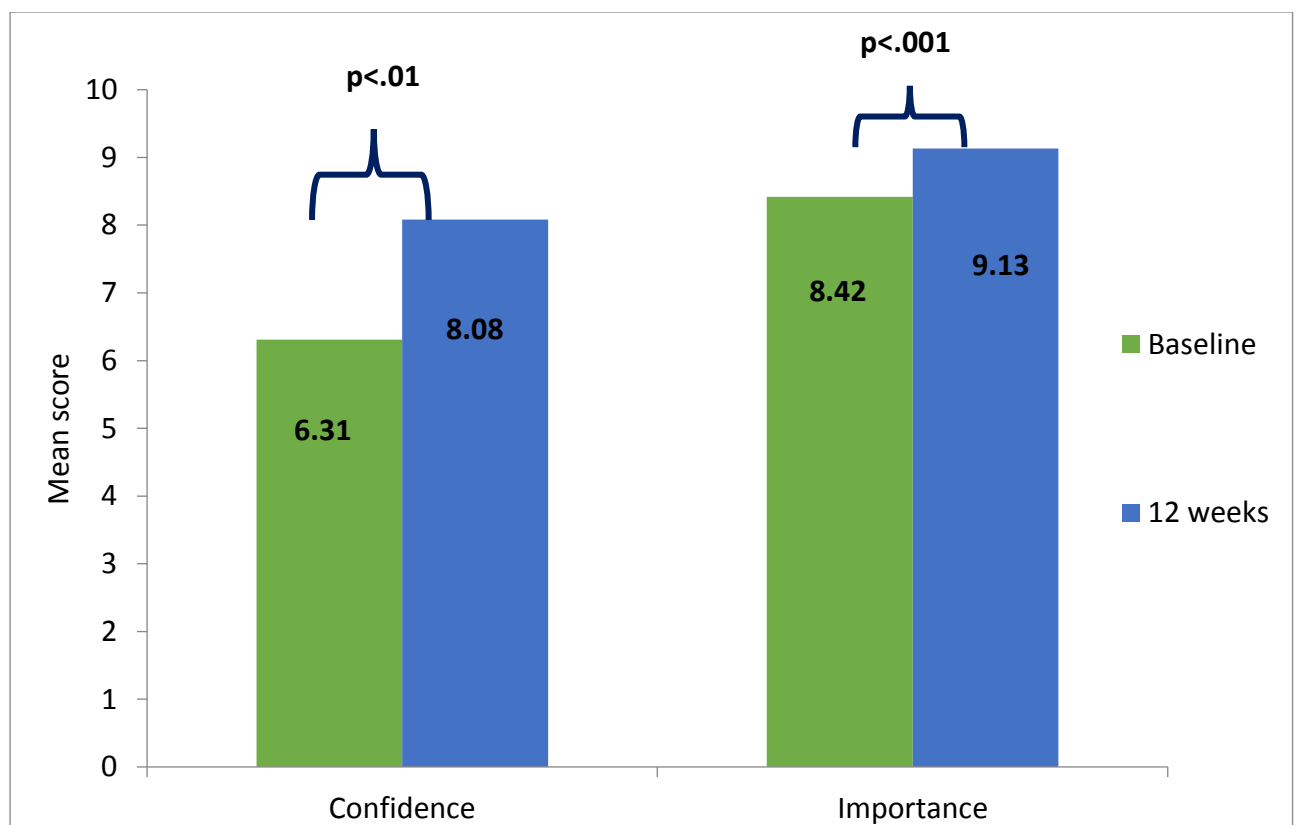
Impact of LGM on confidence and importance

In order to determine whether confidence and importance changed over the course of the 12-week intervention, a repeated measures t-test was used to explore potential differences in levels at baseline vs. 12 weeks. The analysis suggests that, at 12 weeks from baseline, there was a statistically significant increase in both confidence, $t(97) = -8.26$, $p<.01$, and importance, $t(97) = -4.16$, $p<.001$.

This result suggests that using a one-to-one approach, driven by the individual, is successful at improving confidence, and consequently promotes the individual's ability to positively change their behaviour.

Figure 15 displays the mean values for this relationship.

Figure 15 Mean baseline vs. 12-week levels of confidence and importance



¹² As it currently stands, only one participant has provided this data for 6 months, hence this analysis is not included.

Pearson bivariate correlations were also run to explore the relationship between confidence and importance. At baseline, no significant relationship emerged, which suggests that importance and confidence are not related ($r=.12$, $p = .08$). However, at 12 weeks, the relationship between the two variables changes, demonstrating a small but significant positive correlation ($r=.24$, $p<.05$). This suggests that as importance increases, so does confidence.

Relationship between physical activity, confidence and importance

Spearman rho bivariate correlations were also conducted to explore the potential role of confidence and importance in improving levels of physical activity. Baseline levels of confidence did not prospectively predict levels of activity at 12 weeks ($r_s=.04$, $p=.61$) or 6 months ($r_s=.04$, $p=.67$). A result replicated for importance at 12 weeks ($r_s=.08$, $p=.36$) or 6 months ($r_s=.08$, $p=.35$). Together these results suggest that neither confidence in being physically active, or how important physical activity was to the individual, influenced subsequent uptake.

Degree of change in physical activity, confidence and importance

Initial levels of confidence and importance did not prospectively predict change in physical activity at 12 weeks (confidence= $-.12$, $p=.15$; importance: $r=-.53$, $p=.06$) or 6 months (confidence: $r=-.06$, $p=.49$; importance: $r=-.00$, $p=.99$). Together, these results suggest that the baseline levels of confidence to change behaviour and importance of physical activity did not influence the amount of physical activity at 12 weeks or 6 months.

However, a different picture emerges when focusing on the relationship between 12-week assessment of confidence and the change in physical activity from baseline to 6 months.

This analysis produced a significant positive correlation between confidence levels reported at 12 weeks and change in physical activity from baseline to 6 months ($r=.26$, $p=.02$). Hence participants with higher levels of confidence at 12 weeks reported increased positive changes in physical activity over the 6-month period. This suggests that improved confidence levels initiated by the LGM programme were further built upon to increase levels of physical activity.

There were no significant correlations between importance at 12 weeks and physical activity at 6 months.

Confidence and importance profile groups

Responses on the measures of confidence and importance can be divided into four groups, to more clearly illustrate the extent to which individuals are 'ready to change'. Miller and Rollnick (2002) define the individuals within these groups as follows:

1. **Low importance, low confidence:** Neither sees change as important nor believes that they could successfully make such a change if they tried.
2. **Low importance, high confidence:** Confident that they could make a change if they thought it were important to do so, but are not persuaded that they want to change.
3. **High importance, low confidence:** Willing to change, but lacks the confidence to do so.

4. **High importance, high confidence:** Sees change as important and also believes that they could succeed.

To form the four groups outlined above, baseline responses were dichotomised into 'low' (1–5) and 'high' (6–10) for both confidence and importance measures. This led to the numbers shown in Figure 16, below. The majority of participants were categorised as 'high importance, high confidence' (67% (n=138)), followed by 'high importance, low confidence' (29.1% (n=60)). Overall, relatively few participants indicated that being physically active was not important to them (n=8).

Figure 16 Participant profiles at baseline

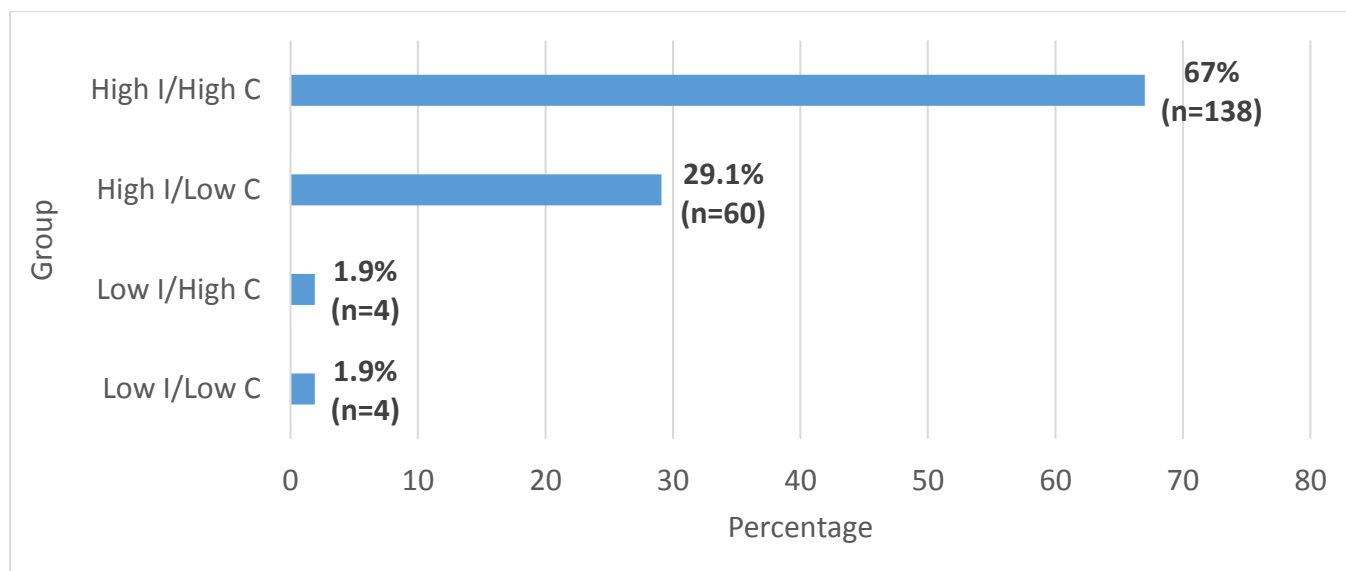
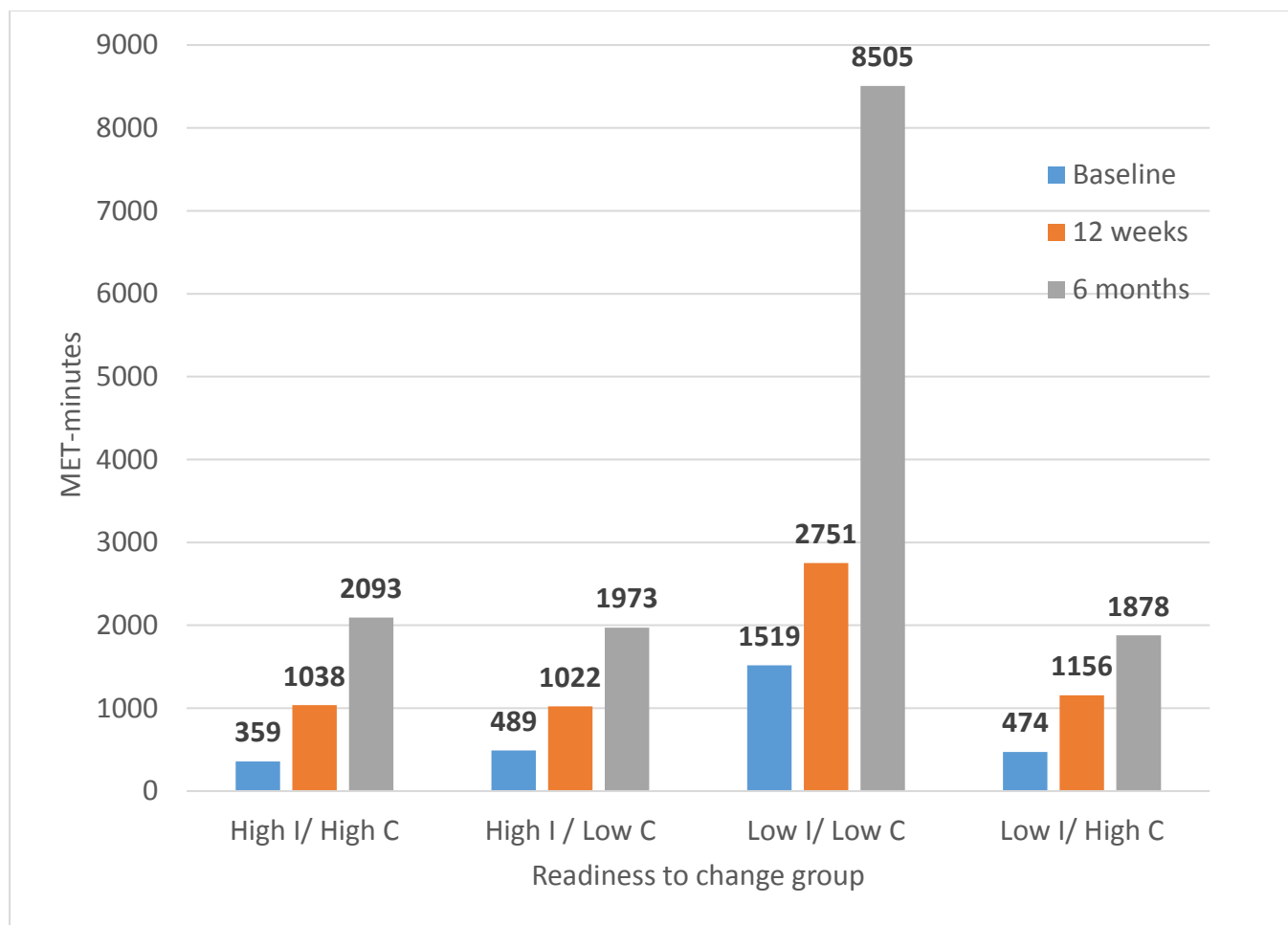


Figure 17 below displays the median MET-minutes in each of the groups at baseline, 12 weeks and 6 months. Improvements in physical activity are noted in all groups, which suggests that initial levels of confidence and importance may have only limited influence on physical activity. This may also be due to the relatively high baseline levels of confidence.

Caution should be exercised when drawing conclusions from the low importance, low confidence group, as only four responses were collected at baseline and 12 weeks, and only one at 6 months. As such, the relatively large improvement noted in this group should not be over-interpreted.

Figure 17 Median total MET values at baseline, 12 weeks and 6 months for each readiness to change group



4.1.3 Impact of LGM on weight

Although changes in weight were not a primary outcome of this particular intervention, data was collected from a small group of participants at the start of the programme. At baseline, 39 participants provided weight data, ranging from 57 to 135 kg, with a mean of 85.77 kg (SD=15.68). At 12 weeks, data was only collected for eight participants, ranging from 66 to 104 kg, with a mean of 85.32 kg (SD=13.98).

For the eight participants who provided weight measurements at baseline and 12 weeks, a paired-samples t-test revealed no significant changes in weight over the time period ($p = .28$). However, given the small number of participants in the analysis, it should be emphasised that no meaningful conclusions can be drawn from this result.

4.1.4 Attrition profiles

At 12 weeks, the proportion of individuals who did not return for an appointment was 26.4% ($n=64$). At 6 months, a total of 33.1% of participants did not supply data. Overall, no follow-up data was collected for 44 participants – 18.1% of the total study population.¹³

¹³ 19 participants who did not attend the 12-week appointment supplied follow-up data at 6 months.

Of those who did not attend either a 12-week or 6-month appointment, 27.9% (n=12) were male and 72.1% (n=31) were female. Broken down by GP surgery, similar levels of attrition were noted across both sites, with 45.5% (n=20) recruited from Surgery 2 and 54.4% (n=24) from Surgery 1. Of those who reported an underlying health condition, 8.8% (n=13) did not attend the appointment at either 12 weeks or 6 months.

Regarding confidence levels, the majority of individuals who did not return were categorised as 'high' – 62.9% (n=22). It may be that these individuals already felt equipped to change without the continuing support of the intervention. Regarding importance, no participants in the 'low' group failed to provide data, while n=35 from the 'high' group dropped out. However it should be noted that, overall, only n=8 participants were categorised as 'low' importance at baseline.

Regarding baseline physical inactivity, the majority of participants who did not attend the 12-week appointment were classified in the 'low' group according to total MET-minutes/week (69.8% (n=30)), of whom 25.6% (n=11) were from the 'moderate' group and 4.7% (n=2) from the 'high'. Looking at this number from a different perspective, 30 participants equates to 20.1% of those identified as engaging in 'low' levels of physical activity. This proportion is higher than both moderate (15.1%) and 'high' (11.1%), which suggests that the low physical activity group may be more vulnerable to attrition and in need of additional support (e.g., peer mentoring, or more regular telephone follow-ups) to prevent drop-out from a physical inactivity intervention.

4.1.5 Participants who did not change behaviour

At 12 weeks, 34 participants reported a decrease in physical activity. Exploring the profile of these individuals, 77.4% (n=24) reported an underlying health condition. An increase in severity of this condition may offer one explanation as to why physical activity levels decreased from baseline. In relation to age, the largest groups of individuals were in the 51–60 years category (35.3%, n=12) and 61–70 years (29.4%, n=10). The majority of participants in this group were 'white British' (82.4%, n=28), while the remaining participants were from six different ethnic groups. Taken together these findings suggests that individuals above the age of 50 with underlying health conditions may also benefit from additional support to enable them to make positive changes in behaviour. It should also be noted that at 6 months a large proportion of those who reported a decrease at 12 weeks (n=21), did go on improve physical activity levels at 6 months (compared to baseline). This suggests the formation of new habits and behaviours may take longer in certain age profiles when co-morbid health conditions need to also be managed.

Regarding confidence, 36.7% (n=11) of participants whose physical activity decreased were identified as being 'low' in confidence and 63.3% (n=19) as 'high'. This equates to 17.2% of all participants identified in the 'low' group at baseline and 13.9% in the 'high' group.

Of the eight participants identified as 'low' importance at baseline, two reported decreased levels of physical activity.

4.2 Qualitative data

4.2.1 LGM participants

Telephone interviews were conducted with seven participants to discuss their views on the impact and organisation of LGM.

Views on LGM intervention

CEPs

Overall, positive feedback on the CEPs was positive. The participants seemed to appreciate the collaborative approach to changing their behaviour, and noted how it differed to previous experiences, where they felt ‘talked at’.

‘Pleased with how helpful the advisor was. I didn’t feel pressured to do anything I didn’t want to do. Was phrased as if you would like to try [...] and put my mind at ease.’ (P001)

Participants also appreciated the personalised advice and how CEPs were knowledgeable enough to adapt advice to the individual.

‘As I say, I liked the fact that you know they did look at what you wanted to do. They did look at trying to find activities that were going to suit you. Some of them, perhaps not always at the time you could possibly do them, but at least there was someone who was actually showing an interest in you.’ (P005)

Recruitment

The GP-headed invitation letter does not seem to have consciously influenced the participants’ decision to join the programme. One participant remarked that it *‘didn’t influence one way or another’* (P001), a second stated *‘No, because I’ve been asking him for ages if there was such a class’* (P004), while another participant did not realise that the referral involved their GP.

Practical arrangements

In general, the participants highlighted the ease, flexibility and efficiency of the appointment-booking process, and noted no particular difficulties in relation to the face-to-face sessions.

Any comments made about the arrangements focused primarily on the organisation of activities outside of the LGM intervention, e.g. complimentary gym classes at a local leisure centre or walking groups.

Feedback on the content of LGM

With regard to the content and purpose of LGM, a couple of participants remarked that the actual intervention was not quite what they had expected. For example, one participant thought that the intervention would involve organised exercise classes, rather than being offered advice about activities that could be undertaken.

‘We were under the impression that it was a class that you were going to. We thought we were going to go to, like, a big room that had lots and lots of people the same as us and you would be encouraged to join different activities of what your interests were.’ (P002)

Another participant expected to receive a personalised exercise programme from the CEP – as opposed to referral to a gym – to compliment the signposting and MI. (P003)

The information provided by ukactive did not suggest the LGM programme would include actual classes, so this may reflect a pre-existing bias regarding individuals' expectations of a physical activity intervention based on previous experience.

Key benefits of LGM

The participants cited as a key impact the extent to which LGM improved levels of motivation to either lose weight and/or engage in more physical activity.

'Yeah I think he was very good in the sense that, "It is down to you". It all had to come from me and I think that is the important thing that by coming from me, that is motivation in itself because it generates that self-motivation in you that has that element of encouragement that goes along with it.' (P005)

Six participants reported that they benefited from the chance to set realistic goals as part of the session.

'I made some goals that I would actually try and do something at least every other day because every day I know it's just an unrealistic target, and I have stuck to that.' (P005)

The participants also noted that the one-to-one support was an important factor in facilitating positive changes in their behaviour.

'[...] sorted out you know other stuff that might have been of interest as well, and passed that on in the interim as well, so yeah they were very good and I had their email if I wanted to contact him, so I knew I could contact them if I wanted to.' (P005)

'The most important thing was that I think because the trainer said that she would be in contact with me within six weeks and phone me to see how it was going and if I had any problems, etc.' (P006)

Impact on physical activity

When discussing the impact on physical activity, all seven participants noted the benefits of the programme and cited examples of how they had increased their level of physical activity as a consequence of the intervention. Some examples are highlighted below:

'I've started walking with a friend once a week, and I've bought a pushbike and intend to start using it instead of buses and taxis' (P001)

'I've started doing aerobics once a week and the gym [...] The first two weeks I felt more energised.' (P004)

'I mean I do go to the gym now and I do try and go there at least twice a week.' (P005)

'So I did and she was very good and put me onto YouTube and showed me quite a few exercises to start with the beginners on the rebounder. So off I go to Argos, bought myself a trampoline rebounder, whatever, and back I came and set up my tablet and off I went, and I thoroughly enjoyed it.' (P006)

4.2.2 Professionals

4.2.3 CEP

The CEP participated in a 30-minute telephone interview to discuss the implementation of LGM in Kent. Discussions focused on the training provided, practical arrangements, views on MI, the resources offered to participants and the structure of the intervention. The main themes that emerged from this discussion are highlighted below.

Training

One aspect noted was the comprehensive nature of the training. The CEP discussed a number of different areas covered by the training programme, including computer systems, consent procedures, information on the questionnaires, and becoming familiar with the participant information pack. The CEP noted that, although the computer systems were unfamiliar, the quality of the training enabled him to acquire these skills quickly.

'I found it okay but we got really trained up for that really well, I must say.'

The CEP also noted how the training programme was heavily focused on Motivational Interviewing and on appropriate techniques within this approach. Due to MI's different approach to other medical professionals, the CEP recognised its importance within the intervention, as well as its positive influence on changing behaviour.

'You're basically asking them, "How much activity do you think you should be doing?" Not like "Right, you should be doing that".'

The CEP also acknowledged that MI is client-focused, which illustrates the extent to which ukactive's training programme was effective in delivering the central tenets of the intervention.

'That's the whole point of my motivational interviews. They are figuring it out all for themselves.'

The CEP recognised that the training provided a good understanding of the theory behind MI, as well as the importance of tailoring the intervention. The CEP provided an example of one MI technique that they learned during the training:

'There's a really good technique that I use with nearly every single patient. When people say "Oh I haven't got time for exercise," I just say, "Right, just run me through a typical day for yourself" – what it would look like from when they get up all the way through from when they go to sleep. So that was a good technique, one from the motivational interviewing, that I found.'

Regarding changes to the training, one suggestion focused on making clearer precisely what the role entails – specifically, the limitations of the role and the responsibilities of the CEP. This was largely in reference to prescribing exercises for participants, and whether this fell within the remit of the CEP.

'You're not sure whether you should be prescribing exercises as well like, for example, yeah... Because your job title is Community Exercise Professional, you might be led to thinking "Ah, I feel like I need to give him some exercises to do" or anything like that, but what a lot of it is, it is signposting.'

Participant resources

Overall, the CEP provided positive feedback about the participant resource pack and its potential positive impact on individuals enrolled on LGM. The activity diary was highlighted as being particularly useful.

'I think it's really good that essentially it gives them something to take home, but the main benefit of that resource pack is actually the activity diary. I think that is the best thing of the whole resource pack.'

One improvement noted was the inclusion of a pedometer, which enabled an objective measure of physical activity.

Executing appointments & follow-ups

The CEP noted that he felt prepared as a result of the training, but recognised the need to build on these skills by seeing patients. With regard to appointments, he noted how the time allotted seemed relatively short considering the additional tasks that run alongside the MI intervention.

'By the time you've done all the informed consent, you've explained the programme, that's a good, like, five/ten minutes gone already, and then you've got forms to fill in and everything like that, then you've got to book their next appointment in that same session. There's quite a lot to do.'

However, the CEP also recognised that the more experience they had in the role, the better they became at keeping the conversations focused and structured. In addition, the CEP noted the importance of being prepared (e.g. organising appropriate signposting resources) prior to each session, which required work outside of clinic hours.

Implementation in GP surgeries

The CEP reported that the implementation of the intervention within the GP surgery was generally positive. The CEP highlighted a number of considerations that are important with regard to ensuring effective delivery, e.g. a supportive practice manager, receptionists who are familiar with the intervention, and maintaining good communication with receptionists (e.g. sharing the LGM appointment list).

Changes to LGM

The CEP proposed two small adaptations that he thought would benefit the intervention – prescribing exercise and gathering anthropometric measurements for all individuals, in order to obtain some objective data to supplement the questionnaire responses. The CEP suggested that the data gathered could be used at the follow-up session as a motivational tool to demonstrate the impact of the behaviour changes over the 12-week period.

'If we take their blood pressure, their rested heart rate and their BMI at the first appointment, and then when they come in on their 12-week appointment we do it again, then we've got a good data there, and again it adds more value to their appointment.'

4.2.4 GP

A GP working at one of the recruitment surgeries offered their views on the implementation of LGM and how they thought it benefited patients.

Implementation of LGM

The GP remarked that he thought the ukactive team worked well, and noted their professionalism with regard to implementing the intervention within the surgery.

However, regarding the challenges of implementation, the GP noted there were some issues related to blood tests being administered before and after the intervention, with participants not attending the later appointment. He proposed that this could be resolved by the CEP being trained in 'point-of-care testing', which would qualify them to take measurements and blood tests within the same appointment as the first LGM session. As the GP noted, this training would enable more subjective data to be collected, and thereby enhance the evidence base for the intervention's impact.

Impact on patients

The GP was of the opinion that LGM has been successful at promoting physical activity. He illustrated the positive impact by highlighting an example from one of his patients.

'There was one chap who couldn't get his arm behind his head and just simple exercises that the health trainer showed him, he was able to, you know, just by doing the exercises, improve his shoulder and neck mobility and he could reach behind his head.'

The GP recognised that the LGM intervention fills a gap that GPs are currently unable to fill. Namely, it enables one-to-one support to be offered in a regular basis and over a relatively long period, in order to support positive behaviour change.

'I'm very pro these kind of projects [...] The messages I need to get out to people and patients are very simple and GPs don't have the time to do that. And when you have someone delivering something on a one-to-one basis, almost across a kind of 12-week period, and you know they get that kind of telephone support and they get guidance, you know, and a lot of people just need the impetus just to get going and I think that's what's more important, you know.'

Overall, the GP viewed the experience as positive for both the practice and the patients. He stated that the challenges that arose during the delivery did not pose serious barriers and would not deter him from involving the practice in other such initiatives.

4.2.5 Practice managers

The practice managers from both GP surgeries participated in a telephone interview, the purpose of which was to explore the how the intervention was implemented within the surgery.

IT

One of the practice managers remarked that the impact on their workload had been minimal, with the majority of the work falling to reception staff. The practice manager commented that the intervention had run very smoothly, with no adverse effects on the receptionists' workload.

Access to the IT system at the surgery was organised externally. Although it took a couple of weeks to organise, once this had been done, accessing the appropriate systems was not problematic.

However, this stands in contrast to the other GP surgery, which initially struggled with exporting the patient lists to Docmail due to the type of software used at this site.

'I thought we could have just printed off things and let them do it but they wanted it put on to their system and we couldn't do it apart from manually.' (PM002)

This increased the workload for the practice staff – who were, at times, under considerable pressure. However, after the manual reporting had been done a number of times, the process became easier.

This was also raised as an issue by ukactive. Subsequently, GP surgeries using the Vision software package will not be eligible to host LGM.

Practical arrangements

With regard to accommodating the CEP, neither surgery remarked that this was a problem, and rooms were made available as and when were needed. Both surgeries made efforts to communicate to all staff that the LGM intervention was taking place, in order to ensure that individuals were familiar with the process associated with the intervention.

The practice manager from Surgery 2 also discussed the challenges related to offering the additional appointment to gather the anthropometric measurements, and reiterated the points made by both the CEP and the GP about separate appointments.

'People are very reluctant to give up their time so they didn't want to come and have their health check, or the initial interview with [CEP] and then come back for a health check. Not many people took that up.' (PM002)

They also went on to recommend future adaptations:

'Once we got it running with the [CEP] doing the health checks, that was the best way to run it, so if you do it anywhere else that's the way it should run, with the adviser doing everything, because then you're saving people the time coming back to make another appointment.' (PM002)

Relationship with CEP

One practice manager expressed that they had expected the CEP to have knowledge of local sports facilities and opportunities for physical activity. However, she didn't feel that this had necessarily been the case, despite the CEP receiving training while preparing for the role. The practice manager felt that this ought to be an important qualification for any future CEP.

'I think if you were going to run it again, I think whoever goes in that role probably should live in the area and [be] someone that knows about the demands. I mean, we have areas of deprivation, so to a degree it's how do you talk to people about healthy eating and healthy lifestyles when you know they are heavy smokers and they are travellers and – or they are on benefits and don't have the money? How do they prepare food more healthily and things like that, you know, and someone who has a local knowledge of all that, I think.' (PM001)

Both surgeries reported a positive working relationship with the CEP. One remarked that the CEP had made efforts to introduce themselves to the other staff, which helped integrate them into the work environment. The second CEP was described as being very good, possessing good working knowledge and being able to relate effectively to a wide range of patients.

Impact on patients

Both practice managers noted the intervention's positive impact on patients. One provided the following example:

'You know, a lot of them were saying to our staff, you know, "Oh, I didn't realise I could go here and do things," and you know, [the CEP] was giving them sort of local places they could go to for sort of free exercise classes and things and, you know, I think it kick-starts people sometimes into, you know, because it's not someone from the practice, it was someone from outside.' (PM002)

One of the practice managers also remarked that the relationship between the CEP and the participant can be an important influence on the extent to which they engage with the intervention.

'They [the participants] did build up a really good relationship with him. At the end, he was chasing people to come back and they were responding more to him than my reception staff ringing them [...] they'd say no to our reception, but when he rang them, "Oh yes, I'll be in" you know!' (PM002)

5. Conclusion

Overall, an uptake in activity was demonstrated by a number of key indicators:

1. Movement between IPAQ categorised activity groups
 - **Low physical activity levels:** At baseline, a large proportion of individuals – **62.1%** – were categorised as 'low' for overall physical activity. At 12 weeks, this proportion **decreased** to **30.6%**, and to **19.3%** at 6 months.
 - **Moderate physical activity levels:** At baseline, a third of the individuals – **30.4%** – were categorised at 'moderate' for overall physical activity. At 12 weeks, this proportion **increased** to **52.0%**, and then **fell** to **42.4%** at 6 months.

- **High physical activity levels:** At baseline, a minority of participants – **7.5%** – were categorised as ‘high’ for overall physical activity. At 12 weeks, this proportion **increased** to **17.3%** and to **38.6%** at 6 months.
2. Degree of change scores
 - For those participants who returned at 12 weeks, the mean degree of change in total physical activity was in a positive direction – **625.18 MET**. For those participants who returned at **6 months**, the result was **1466.77 MET**, suggesting an overall uptake in the amount of physical activity.
 - At **12 weeks**, **70.3%** of the participants who returned for the appointment reported a **positive change** in total physical activity. For those who provided data at 6 months, this proportion rose to **87.1%**.
 - With regard to maintaining the change in behaviour, change score analysis suggests some initial positive evidence. For the 92 participants who reported an increase in physical activity at 12 weeks, **64.1%** reported further increases in physical activity at 6 months, **4.3%** indicated no change, and **31.5%** reported a decrease.
 3. Comparison of baseline physical activity levels to 12 weeks and 6 months
 - Overall, **statistically significant increases** in walking, moderate and vigorous activity were observed at **12 weeks** and **6 months** compared to baseline levels.
 - As to be expected based on the uplift in all the activity types, **total physical activity also significantly improved** at **12 weeks** and **6 months** compared to baseline levels. It also significantly improved between 12 weeks and 6 months.
 4. Types of activity driving the uplift
 - Walking and moderate physical activity were the main drivers of the uptake in physical activity. Of the 121 participants who reported an increase in activity at 12 weeks vs. baseline, **75.2%** reported an uplift in **walking** and **65.3%** in **moderate** activity.
 5. Role of confidence and importance
 - Levels of both confidence and importance increased at 12 weeks compared to baseline.
 - The results suggest that confidence to change behaviour and importance of physical activity at baseline did not influence the amount of physical activity in which participants engaged. However, a different picture emerges when the focus is on the relationship between 12-week assessments of confidence and the change in physical activity at 6 months – namely, a positive correlation is observed. This suggests that participants with higher

confidence levels at 12 weeks go on to report higher levels of physical activity. In other words, it takes time to increase levels of confidence, but higher confidence has a positive influence on physical activity levels.

6. Attrition rates

- 45 individuals who booked in for an initial appointment did not attend the first session.
- Overall, attrition rates were relatively low and in line with expectations for this type of behaviour change intervention. At 12 weeks, **26.4% (n=64)** of participants did not attend the appointment, while at 6 months **33.1% (n=82)** did not respond to a request for data. Taking these figures in to consideration, it suggests that the initial GP screening process identified participants who were broadly willing to commit to the programme.

In addition, the evaluation facilitated exploration of four main aims, of which the key findings are highlighted below.

1. To explore the characteristics of service users who successfully changed their behaviour, in order to predict success in future cohorts or identify service users likely to require greater support.
 - Total levels of physical activity were not significantly affected by gender – the positive impact was equivalent for both males and females. However, for vigorous activity, only female participants noted a significant improvement.
 - There were no significant relationships between total physical activity level and the participants' age.
 - 34 participants reported a decrease in physical activity. Exploring the profile of these individuals, **77.4%** reported an underlying health condition. An increase in severity of a health condition may therefore serve to explain why physical activity levels decreased from baseline.
 - **17.2%** of all participants identified in the 'low' group at baseline, and **13.9%** in the 'high' group, reported a decrease in levels of physical activity. This suggests that those in the low group are marginally more susceptible to not making positive changes in behaviour.
 - **62.9%** of those who did not return any follow-up data were categorised in the 'high' physical activity group. It may be that these individuals already felt equipped to change without the continuing support of the intervention.
 - **20.1%** of those who identified as engaging in 'low' physical activity dropped out before the 12-week or 6-month follow-up. This proportion is higher than

both moderate (15.1%) and 'high' (11.1%), which suggests that the low physical activity group may be more vulnerable to attrition.

- With regard to gender differences in recruitment, females responded with a slightly higher rate compare to males, with a letter-to-attendance conversion rate of **12.7%** for females and **8.3%** for males.
2. To establish whether recruiting participants via systematic screening of GP surgery patient lists is effective.
- The screening process identified a large sample of eligible participants, resulting in 3,030 recruitment letters being sent. It therefore seems that this is an effective mechanism of identifying patients.
 - In addition, this approach recruited more people than the original target of 200. As such, the screening process not only identified patients who were eligible as per the screening criteria, but also those who were physically inactive.
 - The screening process was also successful at identifying 'high value' participants, in that it included many individuals who were physically inactive and had a BMI above 28. The intervention also accessed a high proportion of individuals with disabilities and long-term conditions.
 - However, at baseline, a significant proportion of participants – **30.4%** – were classified as 'moderate', and **7.5%** as high. While these proportions are relatively small (and individuals in the moderate group still have scope to change), it may be that the focus must be on those most in need of the intervention (i.e. patients in the low group). However, in this light, it should be noted that these groupings are based on self-reported data, which is susceptible to over-estimation of activity. Therefore, while participants may have reported activity that classifies them as moderate, an objective assessment may have provided a different picture.
 - The screening and recruitment processes were adapted to reflect the higher proportion of Punjabi-speaking residents in the Surgery 2 catchment area. These included translating the recruitment letter, and ukactive providing a translator for telephone calls. These efforts resulted in **27.2%** of the sample from Surgery 2 being recruited from the 'Asian British' and 'Asian Indian' communities. This compares favourably with the overall percentage residing in the catchment area (9.34%).

3. To establish whether recruiting participants via the systematic screening of GP surgery patient lists is an effective method of recruitment.
 - The time commitment for screening patients was more than expected in one surgery, due to incompatible data systems. By contrast, the other surgery noted the efficiency of the screening process was, and reported that it had minimal impact on time and workload. Therefore, ensuring that the surgery's system is compatible is a key lesson that ukactive has already taken on board.
 - The staff identified no practical barriers to the intervention running at the surgery. Room bookings were co-ordinated effectively, and no additional resources were required from the surgery.
 - Communication between surgery staff and the CEP was seen as a crucial element in the smooth running of the intervention. In both locations, efforts were made to ensure that other staff members were aware of the intervention and that receptionists knew when participants were expected.
 - A key issue that arose at one site was the introduction of gathering anthropometric measurements at baseline and 12 weeks, which required participants to book a separate appointment with the surgery phlebotomist. The participants, CEP, GP and practice manager all highlighted this as a problematic aspect of the intervention. In future iterations, if this additional component is included, it should ideally be incorporated as part of the initial LGM session.

4. To establish whether recruiting a practitioner workforce specifically to deliver interventions is feasible and effective.
 - The data supplied by ukactive and the CEP interview suggests that the training provided in LGM and MI was comprehensive. The CEP demonstrated a clear understanding of the theory and purpose of MI, which indicates that the training was effective.
 - Furthermore, the participants mentioned the setting of goals, the collaborative approach and discussing their motivation – all of which are central tenets of MI. This again emphasises the thorough use of the approach.

- In future iterations, it may be useful to record a selection of sessions to objectively assess and compare the content against the MI framework, in order to ensure a more robust assessment of how the techniques were utilised.
- The CEP had an extensive professional background in providing physical activity support to a wide range of individuals. This experience seems to benefit the delivery of LGM, as it builds on the CEP's existing knowledge and expertise.
- The GP also emphasised the importance of having an 'expert' deliver the intervention, as the CEP's high level of knowledge and confidence will further help participants to change their behaviour.
- It was seen as important that the CEP was local, in order to facilitate a solid knowledge base about opportunities for physical activity.
- The CEP emphasised that the role requires work outside of the session itself. Therefore, other professionals who take on the role would need to be willing to engage in this work. If the professional concerned is not an 'expert' in physical activity, this may also utilise more capacity, as they adapt to unfamiliar resources and providers.

Overall, the evidence suggests that the brief MI intervention has been successful in increasing physical activity levels in a targeted population screened and recruited through GP surgeries.

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Appendix 1: TIDieR Checklist

Item number	Definition
1. Brief name	Provide the name or a phrase that describes the intervention.
2. Why	Describe any rationale, theory, or goal of the elements essential to the intervention.
3. What materials	Materials: Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide information on where the materials can be accessed (e.g. online appendix, URL)
4. What procedures	Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.
5. Who provided	For each category of intervention provider (e.g. psychologist, nursing assistant), describe their expertise, background and any specific training given.
6. How	Describe the modes of delivery (e.g. face-to-face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group
7. Where	Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.
8. When and how much	Describe the number of times the intervention was delivered and over what period of time including the number of sessions, their schedule, and their duration, intensity or dose.
9. Tailoring	If the intervention was planned to be personalised, titrated or adapted, then describe what, why, when, and how.
10. Modifications	If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).
11. How well planned	Planned: If intervention adherence or fidelity was assessed, describe how and by whom, and if any strategies were used to maintain or improve fidelity, describe them
12. How well actual	Actual: If intervention adherence or fidelity was assessed, describe the extent to which the intervention was delivered as planned.

Appendix 2: Interview Guides

LET'S GET MOVING INTERVIEW GUIDE: PARTICIPANTS

Interviewer to:

- note time/date and location of interview
- review PIS & sign consent form

Before commencing interview:

- Welcome and thank for taking part
- Study aims: refresh participant
- No right or wrong answers: please do not be reticent with what you say
- Confidentiality & audio-recording: only the research team will hear the recording & all personal details will be removed. Any quotes will be anonymous.
- Will keep to planned timing; ask if need a break
- Any further questions?

Notify participant that the recorder has been switched on now.

Question (for interviewee)	Rationale & probes (for interviewer)
1. Could you tell me a little about yourself a. Age b. Employment status/type of work c. Health condition d. Reason referred to LGM	Useful to have basic demographic details
2. What activities or exercise did you do in the last year, prior to LGM? a. Has anything made it difficult to exercise or engage in activities that you enjoyed?	Gauge activity levels pre-project Assumption: they did little exercise pre-project
3. What did you think when you first heard about LGM? a. What prompted you to follow up? b. What helped you commit to LGM? c. The letter came from your GP – did this influence your response in any way?	1 st impressions, initial doubts, contemplation of change
4. How did you find the practical arrangements for LGM? a. Could you get an appointment time that suited you? b. Was it convenient attending appointment(s) at the surgery? c. Were the follow up phone calls at a convenient time?	Logistics of the service: what worked, or not?
5. What do you think of LGM overall? a. What did you like about LGM?	Overview & components (process)

<ul style="list-style-type: none"> b. What was helpful about having your own trainer? c. Did you find it helpful making goals? d. How would you explain what a goal is to someone else? e. What did you think about the motivational interviewing? f. How would you explain it to someone else? g. What did you think of the resources you were given? h. Did you get signposted to appropriate activities and/or facilities? i. Did you take part in these activities? <i>If not</i>: What did you decide on instead? j. What did you think of the follow up telephone support? k. Can you think of any improvements we could make? l. Would you recommend LGM to other people? 	<p>Importance of 1:1</p> <p>Understanding of goals</p> <p>Understanding of MI</p> <p>BHF leaflets, resource pack & activity monitoring sheets, pedometer</p> <p>Did Trainers have sufficient local knowledge? Probe if they took part (implies Trainer's judgement was accurate). If not, probe for reasons why not/what else they did.</p> <p>Phone f/u: was this support appropriate/sufficient?</p>
<p>6. How has LGM helped you?</p> <ul style="list-style-type: none"> a. What changes have you made in your daily life? b. What exercise or activities are you doing now that you didn't do before? c. Has it had any effect on how you feel about yourself? d. Have you noticed any changes in your health, for example, how tired you feel? e. Have your friends or family made any comments? 	<p>Assumption: that it has helped. Outcomes.</p> <p>Probe: diet, smoking, activity levels</p> <p>Probe details e.g. Structured/group vs unstructured e.g. gardening. Is it different to pre-LGM activities?</p> <p>Probe: e.g. confidence, mood Anecdotal but relates to c)</p>
<p>7. What might make it difficult to maintain these changes?</p> <ul style="list-style-type: none"> a. Have you thought about how to manage this/these problems? b. Did you talk about this with your Practitioner? c. How confident do you feel about managing your activity levels over the next year? d. What, if any, ongoing support might be useful to help you maintain these changes? 	<p>Assumption: that they will find it difficult</p> <p>LTC may be stable, or not, can they self-manage?</p>
<p>8. Do you have any other comments or suggestions?</p>	

LET'S GET MOVING INTERVIEW GUIDE: PM & GP

Interviewer to:

- note time/date and location of interview
- review PIS & **sign consent form**. X1 copy each.

Before commencing interview:

- Welcome and thank for taking part
- Study aims: refresh participant
- No right or wrong answers: please do not be reticent with what you say
- Confidentiality & audio-recording: only the research team will hear the recording & all personal details will be removed. Any quotes will be anonymous.
- Will keep to planned timing; ask if need a break
- Any further questions?

Notify participant that the recorder has been switched on now.

Question (for interviewee)	Rationale & probes (for interviewer)
1. Could you tell me briefly about your role here?	Intro question to warm up
2. What did you think of Ukactive so far? Do you have any concerns?	Part bridging question, part attitude
3. What activities have you already carried out to support the project? a. What has this meant in terms of your time? b. Was the time commitment what you expected? c. Have you encountered any problems? d. Do you have any suggestions to improve the initial phase?	Probe exactly what they had to do, time taken, what was involved (process)
4. Have there been any practical problems with CEPs using the surgery so far?	e.g. desk space, access to computers (physical and passwords), getting in the way, phone use (barriers)
5. Have there been any problems with their using the surgery's database?	e.g. time taken to show them how to use it (barriers)
6. Are you aware of any problems identifying patients who fit the criteria?	e.g. is the database set up to enable easy identification (barriers)
7. Overall, what do you think of UK Active's project management so far?	Probe what was it like at inception (implementation) and along the way (process). PMs likely to volunteer barriers.
8. Overall what's working well so far?	

9. Have there been any teething problems? How have these been addressed?	Might be related to aspects of project that the PM wasn't directly involved in (facilitators/sustainability)
10. Do you have any other comments or suggestions?	

Thank & close. Turn off tape.

LET'S GET MOVING INTERVIEW GUIDE: Community Exercise Professionals (CEPs)

Interviewer to:

- note time/date and location of interview
- review PIS & **sign consent form**. X1 copy each.

Before commencing interview:

- Welcome and thank for taking part
- Study aims: refresh participant
- No right or wrong answers: please do not be reticent with what you say
- Confidentiality & audio-recording: only the research team will hear the recording & all personal details will be removed. Any quotes will be anonymous.
- Will keep to planned timing; ask if need a break
- Any further questions?

Notify participant that the recorder has been switched on now.

Question	Rationale & prompts
<p>1. Could you tell me a little about your experience with activity promotion?</p>	<p>Warm up & rough gauge re experience with HP and LTCs.</p>
<p>I'm going to ask you about the training for UK Active , the materials they used and carrying out the programme, but we'll do this one thing at a time.</p>	
<p>2. Let's start with the training. Can you tell me what you thought about it overall?</p> <p>a. If you think about the individual components of training can you comment on anything you found particularly helpful?</p> <p>b. Were there any areas that you felt you needed more training in?</p> <p>Motivational interviewing formed a key component of the intervention.</p> <p>c. Did you feel that you had a good understanding of the principles underlying MI?</p> <p>d. Was it difficult to tailor what you'd learnt to the needs of each client and their condition?</p> <p>e. Did you feel confident to judge people's</p>	<p>Training components:</p> <ul style="list-style-type: none"> - Intro to physical activity - Using the GPPAQ - Motivational interviewing (MI) - Training in e-data collection templates - Asking questions about confidence and importance <p>Probe which areas & why</p>

<p>readiness to change?</p> <p>f. Did you have any problems with goal setting and/or reviewing goals?</p> <p>g. Do you have any reservations about using MI? OR your skills in this area?</p>	
<p>3. Overall what did you think of the resources you had available to share with patients?</p> <p>a. What did you like about the materials?</p> <p>b. Was anything lacking? How did you supplement?</p> <p>c. Did you feel confident signposting people using the resources?</p> <p>d. Can you think of anything that could be improved?</p>	<p>Ask about components of materials:</p> <p>Probe what, why and how for a-e.</p>
<p>4. How prepared did you feel for your first clients/service users</p> <p>a. Were there areas that you felt more confident in than others?</p> <p>b. What do you think that was to do with?</p> <p>c. Can you describe a session that didn't go to plan or that you felt didn't go as well as intended?</p> <p>d. Were you able to get appropriate and timely support or guidance if or when you needed it?</p>	<p>Implementation skills, confidence and supervision</p> <p>e.g. previous experience, quality of training</p> <p>Probe how they managed the situation</p> <p>Supervision – timely, helpful?</p>
<p>5. What were your experiences of the follow-ups?</p> <p>a. How did scheduling the follow-up interviews work?</p> <p>b. What discussions were had at the follow-ups?</p> <p>c. What outcomes were reported by participants?</p>	<p>Probe setting up of follow- up and content of consultation</p>
<p>6. Did your view of the programme change from when it started to now?</p>	<p>View over time. Probe how & why</p>

7. Do you have any other comments or suggestions?	Probe any other suggestions to improve the intervention

Thank & close. Turn off tape.