Study Title:

Snacktivity-LBP: Brief Movement for Everyday Life in People with Chronic Low Back Pain

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Protocol Version 1.0

Plain English Summary

Title:

Short bursts of everyday movement for people with chronic low back pain

Summary:

Chronic low back pain is very common and can make it difficult for people to stay active. Although staying active is recommended, many people find it hard to follow structured exercise programmes due to pain, fatigue, lack of confidence, or concerns about making symptoms worse.

This study is testing a different approach called “Snacktivity.” Snacktivity involves doing very short periods of movement (from a few seconds up to a few minutes) spread throughout the day, rather than longer exercise sessions. These small movements are designed to feel manageable, flexible, and easy to fit into everyday life.

The aim of this study is to find out whether this approach is acceptable and practical for people with chronic low back pain. We are also interested in whether it may help people feel more confident about moving, better able to manage their symptoms, and more positive about activity in daily life.

Participants will be randomly allocated to one of two groups:

A Snacktivity group, which includes a 6-week programme with an initial session, weekly check-ins, and guidance on using short movement breaks in daily life

A comparison group, which will receive standard advice about managing low back pain

We will collect information about participants' experiences, confidence, emotional responses, physical function, and quality of life. We will also ask some participants to take part in interviews to better understand their experiences.

This is a pilot (feasibility) study, meaning it is designed to test whether the study methods and intervention work well before running a larger trial in the future.

1. Background and Rationale

Chronic low back pain (CLBP) is the leading cause of years lived with disability worldwide and is associated with substantial personal, social, and economic burden (Vos et al., 2019). People living with CLBP commonly report reduced engagement with physical activity, underpinned by fear of symptom exacerbation, uncertainty about bodily limits, fatigue, fluctuating pain, and diminished confidence to move safely (Vlaeyen & Linton, 2012; Foster et al., 2018). Although international clinical guidelines consistently recommend remaining physically active as a core component of CLBP management, adherence to structured exercise programmes is typically poor, particularly in community-dwelling populations (Geneen et al., 2017; O'Keeffe et al., 2020).

Traditional exercise-based rehabilitation often places implicit emphasis on intensity, progression, or performance targets, which may inadvertently reinforce fear-avoidance beliefs or feelings of failure when individuals are unable to meet prescribed thresholds (Caneiro et al., 2020). For many people with CLBP, the challenge is often a lack of confidence, perceived legitimacy, and practical capacity to engage with movement on a daily basis in the presence of pain (Bandura, 2006; Kent et al., 2018). Interventions that reduce perceived threat, lower cognitive and physical burden, and respect symptom variability are therefore likely to be more acceptable and sustainable.

Snacktivity™ refers to the accumulation of very brief, frequent bouts of movement typically lasting seconds to a few minutes embedded into everyday routines rather than delivered as discrete exercise sessions. Emerging evidence suggests that Snacktivity-based approaches are feasible, acceptable, and capable of increasing overall movement and reducing prolonged sedentary behaviour in adults who are unwilling or unable to engage with structured exercise (Dempsey et al., 2020; Ellingson et al., 2021). Further to this, breaking up sedentary time has been associated with reduced pain sensitivity, improved metabolic health, and improved perceived function, even in the absence of increases in moderate-to-vigorous physical activity (Dunstan et al., 2012; Ellingson et al., 2018). A recent scoping and realist-informed review of Snacktivity-style interventions highlighted that such approaches offer particular promise for populations living with long-term conditions, including musculoskeletal pain, due to their flexibility, low perceived threat, and adaptability to daily context (Alali et al., 2026). Importantly, Snacktivity does not require specialised equipment, high physical capacity, or sustained motivation, and can be self-regulated in response to pain, fatigue, and emotional state. Despite growing interest, existing Snacktivity research has tended to operationalise change narrowly, focusing primarily on step counts, activity accumulation, or metabolic outcomes (Alali et al.,

2026). Such approaches risk overlooking the complexity of behaviour change in chronic pain populations, where meaningful progress may occur through shifts in confidence, emotional adaptation, perceived legitimacy to move, and reconnection with valued activities often prior to, or independent of, large changes in measurable activity volume.

For individuals with CLBP, increases in movement may initially take the form of improved willingness to experiment with activity, greater self-regulation in response to symptoms, or reduced emotional distress associated with movement, rather than immediate increases in intensity or duration (McCracken & Vowles, 2014). Interventions that evaluate success solely through behavioural or physical outputs may therefore fail to capture clinically meaningful early change. Snacktivity interventions that are evaluated using frameworks capable of capturing behavioural, emotional, motivational, and confidence-related change. The Model of Emotions, Adaptation, and Hope (MEAH) provides a theoretically grounded structure for understanding how individuals adapt to a named challenge through processes of emotional awareness, acceptance, goal re-orientation, and hope-related agency (Soundy, 2024). It is particularly important to identifying if and how existing challenges may interfere with an intervention but also could be applied alongside principles of motivational interviewing which often accompany successful Snacktivity interventions (Alali et al., 2026). In parallel, self-efficacy theory highlights the central role of confidence in shaping whether individuals initiate, sustain, and adapt behaviour under conditions of uncertainty (Bandura, 2006). In the context of Snacktivity, confidence judgements relate not only to the ability to move, but also to the ability to self-regulate, stop and restart movement, and integrate activity into complex daily environments while respecting bodily limits.

To date, no Snacktivity intervention for CLBP has explicitly integrated a confidence-focused assessment alongside a structured interpretive framework for emotional and motivational adaptation. Addressing this gap is essential to understanding how low-burden, flexible movement interventions may support meaningful engagement with activity beyond simple activity counts. The intervention prioritises acceptability, feasibility, and engagement, and is explicitly framed to respect pain, uncertainty, and individual bodily limits. Outcomes are selected to capture not only movement engagement, but also confidence, self-regulation, and emotional adaptation, using MEAH as an interpretive lens and a Snacktivity-specific confidence assessment.

2. Aim and Objectives

2.1 Primary Aim

The primary objective of this randomised pilot study is to assess the feasibility and acceptability of delivering a values-informed Snacktivity intervention to adults with CLBP within a parallel-group randomised design.

2.2 Secondary Objectives

To explore changes in:

- Recruitment and retention rates
- Self-efficacy for brief movement
- Hope, adaptation and emotional responses
- Engagement in brief bouts of daily movement

- To examine participant experiences of Snacktivity intervention considering pain management, daily routines, and perceived burden.
- To generate preliminary data to inform a future controlled trial.

3. Methods

The methods are set out in accordance with the CONSORT extension for feasibility studies (Eldridge et al., 2016) and the SPIRIT-PRO (Calvert et al., 2021) guidelines.

3.1 Trial Registration

Trial registration was undertaken and submitted in June 2026 performed at the ISRCTN registry (ISRCTN Registry).

3. 2 Data Sharing

Following completion of the trial all procedures and materials used during the intervention will be provided in a supplementary file in the published manuscript.

3.3 Funding and Conflicts of Interest

No grant funding was obtained for this study.

3.4 Dissemination Policy

Data will be disseminated to trial participants, health professional groups and the public via preprints, plain language summary and publication in open access journals.

3.5 Patient and Public Involvement

Two patient experts were invited to take part and consider the development of the intervention and input to the development stage of the intervention.

3.1 Study Design

The design will be a single arm pilot randomised control trial with parallel groups. The study will take place across a duration of 6 weeks; allocation will be 1:1 and randomisation will take place at the level of the individual. Individuals allocated to the control group will be offered the intervention following the 6-week assessment.

3.2 Trial Setting

This study will take place at the University of Birmingham and be advertised to the community and staff within the University and local Birmingham community, via social media and by contacting people or who are part of the Patient and Public Involvement and Engagement (PPIE) group at the Centre of Precision Rehabilitation for Spinal Pain (CPR Spine).

3.2 Recruitment

Participants that are eligible will be required self-referral to posters identified within communal areas of the University and local Birmingham community and or from a general email sent to the PPIE linked to CPR Spine.

3.3 Participants

The below inclusion and exclusion criteria will be applied:

3.3.1 Inclusion Criteria

- Adults aged ≥18 years
- Diagnosis of CLBP (≥3 months duration). CLBP will be defined as pain in the lumbar region persisting for three months or longer.
- Back pain which is not attributable to a specific cause i.e., people with non-specific CLBP will be recruited
- Living independently in the community
- Able to stand and move with or without discomfort and able to engage with light physical movement as part of daily activities
- Able to provide informed consent

3.3.2 Exclusion Criteria

- Acute LBP (<3 months)
- Serious spinal pathology (e.g., fracture, malignancy, infection) or uncontrolled comorbidities (including major psychiatric conditions, uncontrolled diabetes or heart failure)
- Specific causes of CLBP e.g., lumbar radiculopathy
- Neurological conditions severely limiting movement
- Current participation in structured exercise rehabilitation (>2 sessions/week)
- Pregnancy

3.4 Intervention Overview

3.4.1 Name of Intervention

Snacktivity-LBP

The Snacktivity intervention is based on the accumulation of brief, flexible bouts of movement ("snacks") integrated into everyday routines. Movement snacks are intentionally short (seconds to a few minutes), adaptable, and self-regulated, allowing participants to respond to pain, fatigue, and daily context. These brief movements and enhancing sedentary breaks for people with low back pain. The details of the intervention and specific elements of the intervention can be seen in Table 1 for the TiDieR description of the intervention.

Table 1 The TiDieR considerations for the Snacktivity intervention

Item	Description
1. Brief name	Snacktivity-LBP: Brief Movement for Everyday Life
2. Why	To support engagement in brief, flexible movement among adults with chronic LBP using a low-burden Snacktivity approach framed by autonomy, respect for bodily limits, and self-regulation. Small bouts of regular activity may be more manageable, improve confidence and create more positive beliefs around movement in chronic LBP. Snacktivity targets the principle that breaking up sedentary behaviour has more significant reduction on pain outcomes compared to reducing total sedentary time or increasing MVPA or VPA (Ellingson et al., 2021). The limited duration of 6 weeks is selected to focus on changes in confidence
3. Materials	Facilitator manual; participant handbook and booklets of Snacktivity exercises; optional reflection sheets; no specialist equipment. Smartphone or activity watch used to set reminders. Participation information sheet

4. Procedures	An initial in-person or online group session introducing and providing education on Snacktivity principles, Model of Emotions, Adaptation and Hope (MEAH) and motivational interviewing screening and support, and introduction to the home-based Snacktivity booklet. Weekly check-in with trained student PT to identify MEAH ratings and updates around improvement.
5. Provider	Trained physiotherapy undergraduate and postgraduate students educated with understanding of the MEAH, motivational interviewing and simulated training with expert patients.
6. How	Face-to-face or online group delivery sessions with individualised MEAH and motivational interviewing component, alongside a self-directed home-based 6-week practice. During the 6-week home practice reminders will be sent to mobiles.
7. Where	Community in person at a room or quiet space like coffee shop at the University of Birmingham or online and any further check in meetings online.
8. When and how much	Six weekly sessions (60–75 minutes) over six weeks, plus optional daily Snacktivity practice of undertaking breaks in movement lasting from 30 sections to 5 minutes.
9. Tailoring	All movement snacks are self-selected and adapted by participants based on pain, fatigue, and daily routines.
10. Modifications	Any safety-related or accessibility-related modifications will be documented.
11. Fidelity (planned)	Facilitator training and session checklists.
12. Fidelity (actual)	Attendance, retention, and participant-reported engagement.

3.4.2 Content of Intervention

Week 1: Introduction to Snacktivity group session followed by individual MEAH/Motivational Interviewing session.

Duration: 60–75 minutes (group session in person groups or online groups to suit preference of included participants). The content is identified below.

Content:

1. Education
    a. Chronic LBP condition, nature of chronic pain, pain ≠ harm
    b. Movement variability and benefits of movement (target yellow flags)
    c. Movement can be brief and still meaningful
    d. Health risks of sedentary lifestyle
    e. Habit formation
2. Introduction to Snacktivity
    a. Movement in short bouts (30 seconds–5 minutes)
    b. Distributed across the day, embedded into existing routines
    c. Regular to break up sedentary time more important than doing it all in one go
    d. Consistency matters more than intensity
    e. Clear distinction between Snacktivity and “exercise programmes”
    f. No requirement to push through pain, stopping is permitted and encouraged

    Frame Snacktivity using broad, optional values language without asserting psychological mechanisms. Values used as language & framing tools, not outcomes.

    - Fairness to the body
    - Respecting limits
    - Self-regulation rather than endurance
    - Non-comparison
3. Individualised MEAH and Motivational interviewing (See Appendix B)
    a. External cues for movement (i.e. activity watch, phone)

b. Coping strategies (e.g. desk work, finish 1 review, 5 min break, next one)
c. Social accountability identification, how are they going to monitor goal, reward?

Week 2-6:

Individualised check-ins and Snacktivity practice

Purpose: Online or phone individualised check-in with trained student physiotherapist. See Appendix C for content.

Snacktivity Practice and prompting

Home-Based Practice: Participants are encouraged to engage with Snacktivity throughout the week using the snacktivity booklet as inspiration. During the check-in the student physiotherapist will make a note of what they are engaging with most.

Prompting: Student physiotherapist to send text message prompts twice a day as a reminder to get up and move. The text message will read:

> *This is a friendly reminder to get up and move as part of the Snacktivity intervention you are participating in. Need to reach out? Please do* 😊 .

3.5 Comparator group

Participants randomised to the control group will receive standard NHS self-management advice for chronic low back pain, replicated using an NHS patient information booklet routinely provided within community musculoskeletal services. The booklet focuses on reassurance, maintaining activity, pacing, and self-management, and reflects usual care practice. No Snacktivity-specific framing, confidence-based guidance, or behavioural support will be provided.. Standard care will be replicated using materials adapted from the Midlands Partnership University NHS Foundation Trust lower back pain self-management resources Please see: Lower Back :: Midlands Partnership University NHS Foundation Trust

This identifies the following: There are several ways you can help yourself including:

- Taking pain medication
- Keep active and avoid static postures/positions
- Trying core stability exercises / pilates / yoga
- Learning how to relax (particularly your shoulder and neck muscles)
- Find a balance between rest and some activity, try not to overdo things (alter activities that make it worse so they are less painful)
- Using cold treatment, eg. ice packs, or heat treatment, eg. heat packs
- Find a sleeping position that is most comfortable for you, using pillows for support
- Maintain a healthy Body Mass Index (BMI). Being overweight can increase your risk of developing back pain.

Regular exercise has been shown to be the most helpful treatment for back pain. It doesn't matter what type of exercise you do, as long as you keep active. Choose something that you like to do and keep at it.

If you have pain that doesn't show any signs of improvement, or worsens, within a couple of weeks, consider seeking further advice from your GP/Health Care Professional.

4 Outcomes and Measures

4.1 Primary Outcomes (Feasibility)

In line with recommendations by Eldridge et al. (2016), the primary outcome of this pilot RCT is trial feasibility rather than intervention effectiveness. Feasibility outcomes are pre-specified and operationalised using bespoke data-collection forms addressing recruitment, retention, intervention adherence, acceptability, and outcome data completeness. These outcomes will be used to inform progression criteria and the design of a future definitive trial. See Appendix A for the form used.

4.2 Secondary Outcomes (Exploratory)

4.2.1 Snacktivity-Specific Self-Efficacy (Bandura, 2006)

A Snacktivity Self-Efficacy Scale (S-SES) will be developed following Bandura's (2006) guidelines. Please see Appendix B for the scale.

4.2.2 Pain Self-Efficacy Quesitonnaire (PESQ; Nicolas, 2007)

The Pain Self-Efficacy Questionnaire (PSEQ) is a self-report measure designed to assess the degree of confidence individuals have in performing activities despite pain. The questionnaire consists of 10 items, each rated on a 7-point Likert scale (0–6), yielding a total score range of 0–60, with higher scores indicating greater pain self-efficacy. Total scores are calculated by summing item responses. Higher scores reflect stronger beliefs in functional capability despite pain. The PSEQ has demonstrated strong internal consistency, test–retest reliability, and sensitivity to change in chronic pain populations. Justification for use

4.2.3 Cognitive Flexibility Scale (Martin and Rubin, 1995)

The Cognitive Flexibility Scale assesses an individual's perceived ability to adapt thinking and behaviour in response to changing situational demands. It comprises 12 items, rated on a 6-point Likert scale, with higher scores indicating greater cognitive flexibility. Items are summed to create a total score. The scale demonstrates good internal consistency and construct validity, particularly in relation to adaptive coping and problem-solving.

4.2.4 Emotional Regulation Questionnaire (EQR; Gross and John, 2003)

The Emotion Regulation Questionnaire measures habitual use of two emotion-regulation strategies: cognitive reappraisal and expressive suppression. The ERQ consists of 10 items, rated on a 7-point Likert scale, producing two subscale scores. Subscale scores are calculated by averaging relevant items. Higher scores indicate greater use of the respective regulation strategy. The ERQ has strong psychometric support across clinical and non-clinical populations.

4.2.5 Emotional Adaptation and Hope (MEAH; Soundy 2024)

The Model of Emotions, Adaptation and Hope (MEAH) (Soundy, 2024) will be used as an interpretive framework to explore emotional and motivational adaptation to movement with chronic pain within an interview (See Appendix 2). But also as a screening tool to document change in psychological adaptation and emotions. The questionnaire has 5 items. The first item will identify a named challenge relating to Snacktivty. The following items will rate that for hope, adaptation, energy, and pleasantness (see Appendix B).

4.2.6 Oswestry Disability Index (ODI; Fairbank and Pynsent, 2000)

The Oswestry Disability Index is a condition-specific measure of functional disability related to low back pain. It comprises 10 sections, each scored on a 0–5 scale, with total scores converted to a percentage (0–100%). Higher scores indicate greater disability. The ODI is widely regarded as a gold-standard measure for low back pain–related disability and demonstrates excellent reliability, validity, and responsiveness.

4.2.7 SF-12 (Ware et al., 1996)

The SF-12 is a brief generic measure of health-related quality of life derived from the SF-36. It yields two summary scores: the Physical Component Summary (PCS) and Mental Component Summary (MCS). Scores are calculated using standardised weighting algorithms and norm-based scoring, with a population mean of 50. Higher scores indicate better health status.

4.2.8 Measuring daily steps

A fitbit tracker or validated step count wristwatch will be used to document objective daily steps and movement.

4.2.9 Qualitative interviews:

An initial interview schedule and final interview schedule will be created to assess the 6 week program. Appendix D provides questions for this.

4.3 Data Analysis

Descriptive statistics for feasibility outcomes. Pre–post exploratory analyses with a focus on confidence intervals and identification of effect will be given. Reflexive thematic analysis of qualitative data will be undertaken. No hypothesis testing regarding causal mechanisms

5. Harms

Given the low-risk, non-invasive nature of the Snacktivity intervention, serious adverse events are not anticipated. However, potential harms may include transient increases in pain, discomfort, fatigue, or symptom flare-ups associated with everyday movement.

5.1 Assessment of Harms

Harms will be assessed using both systematic and non-systematic (passive) surveillance approaches.

5.1.1 Systematic harms assessment

At each weekly check-in, participants will be asked general, open questions regarding health status and symptom changes, including (See Appendix C):

- changes in pain severity compared with usual levels,
- new neurological symptoms (e.g. weakness, numbness, tingling),
- injuries or medical consultations since last contact.

These questions will be asked by trained members of the research team, who are not blinded to group allocation (due to the behavioural nature of the study).

Harms data will be recorded descriptively, including timing, severity (mild, moderate, severe), and whether participation was modified or discontinued as a result.

5.1.2 Non-systematic harms assessment

Participants may also report adverse events spontaneously at any point during the study. All reported events will be logged by the research team.

5.2 Reporting

Any serious adverse events judged to be related to study participation will be reported to the study sponsor and Research Ethics Committee in line with institutional policies. Given the feasibility nature of the study, no formal statistical analysis of harms is planned; harms will be summarised descriptively.

6. Participant Timeline

Participants will take part in the study for approximately 6 weeks.

The participant timeline includes:

- Screening and eligibility assessment
- Baseline data collection
- Randomisation
- Intervention period (Snacktivity or comparator)
- Weekly brief check-ins
- End-of-study assessments and qualitative interview

A schematic schedule of enrolment, interventions, and assessments is provided in **Figure 1**

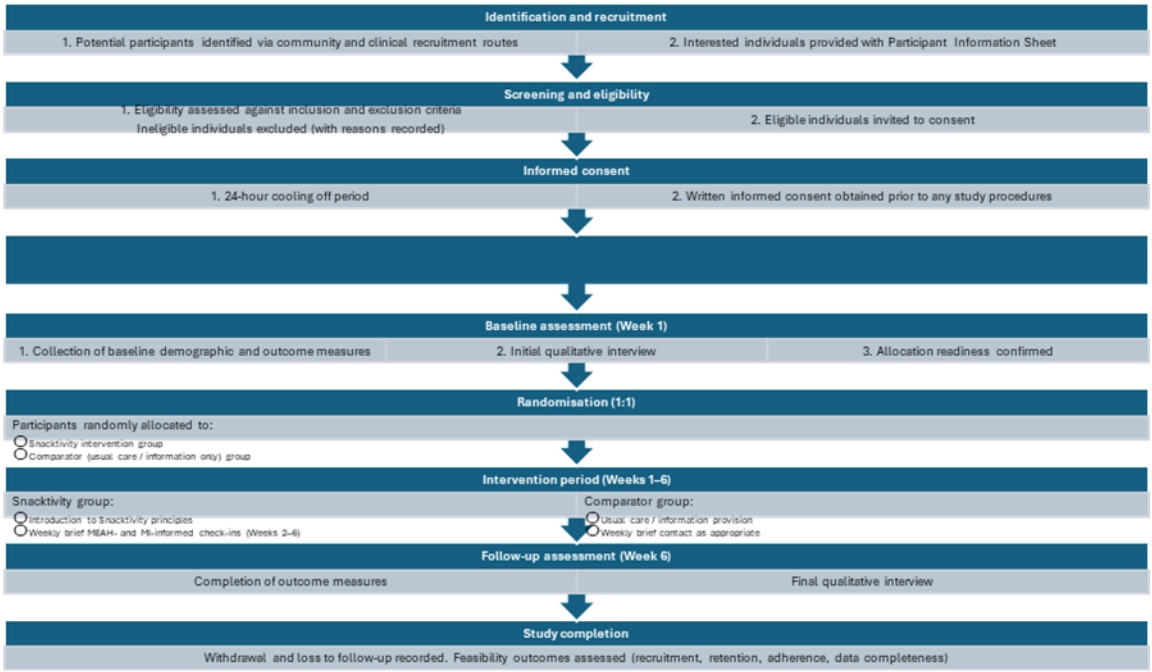


Figure 1 Diagram to identify procedures

7. Sample Size

This study is a feasibility randomised controlled trial and is not powered to test effectiveness.

The sample size is based on recommendations for feasibility studies, focusing on estimating recruitment, retention, adherence, and outcome variability to inform a future definitive trial. A total sample of [n = 60] participants (approximately [1/2] per group) is considered sufficient to meet these feasibility objectives.

No formal hypothesis-testing sample size calculation has been performed. Estimates derived from this study will be used to inform future sample size calculations.

8. Recruitment

Participants will be recruited from the local community and via social media, including:

- community advertisements,
- online or university-affiliated channels.
- X, Facebook and other social media platforms
- Spinal pain PPIE group at the University of Birmingham

Recruitment strategies are designed to minimise participant burden and support inclusivity. All recruitment materials will be approved by the Research Ethics Committee prior to use. Participants will be offered an amazon voucher for the baseline assessment and following the end of the study (6-week assessment) as well as one follow-up (at 12-weeks).

8.1 Randomisation: Sequence Generation

8.1.1 Sequence generation

The random allocation sequence will be generated independently by a member of the research team not involved in participant recruitment or assessment, using a computer-generated randomisation procedure.

8.1.2 Type of randomisation

Participants will be randomised using **simple randomisation** in a 1:1 allocation ratio to:

- Snacktivity intervention group, or
- comparator group (usual care / information only).

No stratification factors are planned for this feasibility study.

8.1.3 Allocation Concealment Mechanism

Allocation concealment will be ensured using a centralised randomisation procedure. The allocation sequence will be stored electronically in a secure location inaccessible to personnel responsible for participant enrolment.

Group allocation will only be revealed after baseline data collection is complete.

8.1.3 Implementation

Participants will be enrolled by trained members of the research team. Allocation to intervention groups will be implemented following baseline assessment and confirmation of eligibility.

Personnel involved in enrolling participants will not have access to the randomisation sequence. The allocation list will be securely stored to prevent prediction of future assignments.

8.1.4 Blinding

Due to the behavioural nature of the Snacktivity intervention, participants and intervention facilitators cannot be blinded to group allocation.

Outcome assessors for self-reported measures will be the participants themselves. Quantitative data analysis will be conducted with group labels coded where feasible to reduce analytic bias.

8.1.5 Blinding procedures and unblinding

No formal blinding procedures are applicable. As there is no blinding, no unblinding procedures are required.

9. Ethics and Governance

This study will be conducted in accordance with recognised ethical principles for research involving human participants, including the Declaration of Helsinki, relevant UK research governance frameworks, and data protection legislation (UK GDPR and the Data Protection Act 2018).

Ethical approval will be sought from an appropriate Research Ethics Committee (REC) prior to study commencement. All study procedures, participant materials, and data handling processes will be reviewed and approved before recruitment begins.

9.1 Informed Consent

Participation in the study is entirely voluntary. All potential participants will be provided with a Participant Information Sheet outlining the purpose of the study, what participation involves, potential risks and benefits, and how data will be managed. Written informed consent will be obtained prior to any study procedures.

Participants will be informed that they may withdraw from the study at any time, without giving a reason and without any impact on their usual care or legal rights. If a participant withdraws, data already collected will be retained unless the participant explicitly requests its removal, in line with ethical and regulatory guidance.

9.2 Risk of Harm and Participant Safety

The Snacktivity intervention involves **short, self-directed everyday movement** and is considered low risk. Nevertheless, there is a possibility that participants may experience temporary discomfort, increased pain, fatigue, or symptom fluctuation.

To minimise risk:

- Participants are explicitly encouraged to adapt or stop movement activities if they feel uncomfortable.
- No prescriptive exercise, targets, or intensity thresholds are imposed.
- Weekly check-ins include open questions to identify any changes in health status or symptoms.

Any adverse events reported during the study will be documented and managed appropriately. Serious adverse events deemed related to study participation will be reported to the study sponsor and ethics committee in accordance with institutional policies.

9.3 Psychological and Emotional Considerations

Given that discussions may involve experiences of pain, uncertainty, or frustration, the study adopts a non-judgemental, supportive, and participant-led approach informed by MEAH principles and motivational interviewing. Interviews are designed to explore experiences rather than promote behaviour change or provide treatment.

If participants become distressed during interviews or check-ins, the session will be paused or stopped as appropriate, and participants will be offered information on relevant support services where needed.

9.4 Confidentiality and Data Protection

All participant information will be handled confidentially. Data will be pseudonymised using unique study identification codes, and identifiable information will be stored separately from research data on secure, password-protected servers accessible only to authorised members of the research team.

Data will be collected, stored, and processed in accordance with UK GDPR requirements. Audio recordings of qualitative interviews will be transcribed and anonymised, with recordings deleted once transcription accuracy has been confirmed.

9.5 Dissemination and Use of Results

Study findings will be disseminated through academic publications, conference presentations, and reports. No individual participant will be identifiable in any dissemination outputs. Participants will be offered a plain-language summary of the study findings if they wish.

9.6 Ethical Proportionality

As a feasibility study, this research is designed to minimise participant burden and risk while generating information to inform the development of a future definitive trial. The ethical approach taken reflects the low-risk nature of the intervention while prioritising respect, autonomy, and participant wellbeing throughout.

10. Expected Contribution

This study will:

- Establish whether Snacktivity is acceptable and feasible for people with chronic LBP in the community
- Provide insight into how brief, values-informed movement is experienced alongside pain
- Generate data to inform a future controlled trial without overstating mechanism or efficacy

11. Protocol Summary

This feasibility study evaluates a community-based Snacktivity intervention for adults with chronic low back pain. The programme promotes brief, flexible movement embedded into daily routines and framed using non-prescriptive values language. The intervention prioritises acceptability, autonomy, and engagement rather than symptom reduction or causal claims, aligning with current evidence and guideline recommendations for chronic low back pain.

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Appendicies

Appendix A: Outcome measures

Appendix B: Intervention MEAH initial meeting (week 1)

Appendix C: Intervention check-in script (weeks 2-6)

Appendix A

Demographic outcomes and other outcome measures

Participant Demographics and Background Questionnaire

Study ID: _____
Participant ID: _____
Date: ____ / ____ / _____

Section A: Basic Information

1. **Age (years): _____**
2. **Sex assigned at birth:**
   ☐ Female
   ☐ Male
   ☐ Intersex
   ☐ Prefer not to say
3. **Gender identity:**
   ☐ Woman
   ☐ Man
   ☐ Non-binary
   ☐ Prefer to self-describe: _____
   ☐ Prefer not to say
4. **Ethnicity (UK categories):**
   ☐ White
   ☐ Mixed / Multiple ethnic groups
   ☐ Asian / Asian British
   ☐ Black / African / Caribbean / Black British
   ☐ Other ethnic group: _____
   ☐ Prefer not to say

Section B: Social and Lifestyle Factors

1. **Highest level of education completed:**
   ☐ No formal qualifications
   ☐ GCSEs (or equivalent)
   ☐ A-levels (or equivalent)
   ☐ Undergraduate degree
   ☐ Postgraduate degree
   ☐ Other: _____
2. **Employment status:**
   ☐ Full-time employed
   ☐ Part-time employed
   ☐ Self-employed
   ☐ Student

☐ **Unemployed**
☐ **Retired**
☐ **Unable to work due to health**
☐ **Other: _____**

3. **Occupation (if applicable): _____**

4. **Living situation:**
   ☐ **Live alone**
   ☐ **Live with partner/family**
   ☐ **Shared accommodation**
   ☐ **Other: _____**

Section C: Health and Clinical Information

1. **Duration of low back pain:**
   ☐ **3–6 months**
   ☐ **6–12 months**
   ☐ **1–2 years**
   ☐ **>2 years**

2. **Average pain intensity (last 7 days):**
   (0 = no pain, 10 = worst possible pain)
   Score: ___ / 10

3. **Do you have any other long-term health conditions?**
   ☐ **No**
   ☐ **Yes (please specify): _____**

4. **Current medications related to pain:**
   ☐ **None**
   ☐ **Yes (please list): _____**

5. **Have you received treatment for back pain in the last 6 months?**
   ☐ **No**
   ☐ **Yes (tick all that apply):**
   ☐ **Physiotherapy**
   ☐ **GP care**
   ☐ **Specialist care**
   ☐ **Exercise programme**
   ☐ **Other: _____**

Section D: Physical Activity and Behaviour

1. **How would you describe your current physical activity level?**
   ☐ **Very inactive**
   ☐ **Somewhat inactive**
   ☐ **Moderately active**
   ☐ **Active**
   ☐ **Very active**

2. **Time spent sitting during a typical day:**
   ☐ **<4 hours**
   ☐ **4–6 hours**
   ☐ **6–8 hours**
   ☐ **>8 hours**

3. **Do you regularly take breaks from sitting?**
   ☐ **Never**
   ☐ **Rarely**
   ☐ **Sometimes**
   ☐ **Often**
   ☐ **Always**

Section E: Technology and Study Participation Factors

1. **Do you own or regularly use a smartphone?**
   ☐ **Yes**
   ☐ **No**

2. **Are you comfortable receiving text message reminders?**
   ☐ **Yes**
   ☐ **No**

3. **Have you previously used a step counter or activity tracker?**
   ☐ **Yes**
   ☐ **No**

Section F: Optional Psychosocial Context

1. **Confidence in being physically active despite pain:**
   (0 = not confident at all, 10 = completely confident)
   Score: ___ / 10

2. **Biggest challenge to movement currently (free text):**

Section G: Consent for Data Linkage (Optional)

☐ **I consent to my questionnaire data being linked with study outcome data**

Primary Outcome Data Collection Form: Trial Feasibility Questionnaire

Section A: Study Identification

- Study ID: _____
- Participant ID (if applicable): _____
- Study arm: ☐ Snacktivity ☐ Control
- Data collector initials: _____
- Date of completion: ___ / ___ / _____

Section B: Recruitment Feasibility

Item	Response
Date participant identified as eligible	___ / ___ / _____
Date consent obtained	___ / ___ / _____
Recruitment pathway	☐ GP ☐ Community ☐ Online ☐ Other (specify)
Was participant recruited within target timeframe?	☐ Yes ☐ No

Section C: Retention and Follow-up

Item	Response
Participant completed baseline assessment	☐ Yes ☐ No
Participant completed follow-up assessment(s)	☐ Yes ☐ No ☐ Partial
If not completed, main reason	☐ Withdrew ☐ Lost to follow-up ☐ Health ☐ Time ☐ Other
Number of follow-up contacts required	☐ 1 ☐ 2 ☐ 3+

Section D: Intervention Adherence (Snacktivity Arm)

(Primary feasibility indicator if adherence is prioritised)

Item	Response
Number of intervention weeks completed	___ / ___ weeks

Mean Snacktivity bouts per day	_____
Days meeting Snacktivity prescription	___ / ___ days
Participant met minimum adherence threshold?	☐ Yes ☐ No

Operational definition (pre-specified):
Minimum adherence defined as ≥ X Snacktivity bouts/day on ≥ Y days/week.

Section E: Outcome Data Completeness

Outcome	Complete?
Primary outcome measure(s)	☐ Yes ☐ No
Physical activity device data valid	☐ Yes ☐ No
Questionnaire data complete	☐ Yes ☐ No
Missing data exceeds acceptable threshold?	☐ Yes ☐ No

Section F: Acceptability (Brief)

Item	Response
Participant reported intervention acceptable	☐ Yes ☐ No
Would participant recommend to others?	☐ Yes ☐ No
Any adverse or unintended effects reported?	☐ Yes ☐ No

Section G: Overall Feasibility Assessment

Based on this participant's data, feasibility was:

☐ Achieved as planned
☐ Achieved with minor issues
☐ Not achieved – substantive modification required

Comments:

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3. Optional: Progression criteria summary (strongly recommended)

You can add a **separate table** in your protocol:

Feasibility domain	Green (go)	Amber (amend)	Red (stop)
Recruitment rate	≥ X/month	X–Y/month	< Y/month
Retention	≥ 80%	60–79%	< 60%
Adherence	≥ 70% meet threshold	50–69%	< 50%
Data completeness	≥ 90%	70–89%	< 70%

Confidence for Snacktivity Scale

The Confidence for Snacktivity Scale was developed in accordance with Bandura's (2006) guidelines for constructing self-efficacy measures, emphasising task-specific capability judgements related to brief movement, pain-responsive self-regulation, breaking up sedentary time, and environmental adaptability.

This scale identifies how confident you feel towards snack-based activity and breaking up sedentary movement. The items identified assess capability judgements, not outcomes

0–10 confidence scale (0 = not at all confident; 10 = completely confident)

These questions ask about what you feel capable of doing, not what you think will happen.

Snacktivity capability (core behaviour)

1. "I can do short bouts of movement even when my back pain is present."
2. "I can fit brief movement into my daily routine, even on busy days."
3. "I can do movement in short bursts rather than needing to exercise for a long time."

Pain-responsive self-regulation *(This captures regulation)*

1. "I can stop, slow down, or modify movement when my pain increases."
2. "I can restart movement later if I stop because of pain or fatigue."

Breaking up sedentary time *(capability judgements)*

1. "I can break up long periods of sitting with brief movement during the day."
2. "I can remind myself to move after sitting for a while."

Environmental access and adaptability *(Addresses environment explicitly and appropriately.)*

1. "I can find places or moments in my daily environment where I can move briefly."
2. "I can adapt movement to the space I am in, such as at home or in the community."

Body-respectful movement

1. "I can move in a way that feels respectful of my body rather than pushing myself."

Appendix B

MEAH Interview Positioning (for interviewer)

This interview is designed to explore experiences, not to provide treatment or advice. The interviewer's role is to support reflection, curiosity, and meaning-making around Snacktivity.

- Do **not** prescribe movement
- Do **not** problem-solve unless participant initiates
- Use reflective listening
- Permission should precede deeper exploration

Section 1: Orientation to Snacktivity

Interviewer script (brief):

"We're interested in understanding people's experiences of moving in short, everyday ways, sometimes called Snacktivity. This can include small bits of movement throughout the day, done in ways that feel manageable. There are no right or wrong answers."

Section 2: Identifying Challenges to Snacktivity

Core Elicitation Question

"When you think about trying to move in small, everyday ways (Snacktivity), what feels most difficult or gets in the way for you at the moment?"

Allow uninterrupted response.

Identifying the Top Three Challenges

"Often there are several different challenges. Could we identify the three main challenges that feel most important or impactful for you right now when it comes to Snacktivity?"

There may be other challenges important too and if there are then list them here:

- **Challenge 1 (most important focusing on):** _____
- **Challenge 2:** _____
- **Challenge 3:** _____

(If fewer than three are identified, proceed with those named.)

Section 3: MEAH Ratings for Each Challenge

Repeat the following **for each challenge**, one at a time.
Use the same order for consistency.

Introduction to Ratings

"I'll ask a few short questions about this challenge, just to get a sense of how it feels for you right now."

AREA	Scale

	Extreme high or complete response	Middle or average response	Extreme Low, no ability or response which shows rejection
Q2:Hope How hopeful are you right now you can change this?	Completely hopeful 	Accept it may not be possible to change 	See no hope or ability to change 
Q3:Acceptance To what extent are you able to accept this difficulty currently?	Completely able to embrace 	Can acknowledge it 	Not able to accept and reject it 
Q4: Energy How much energy do you have to deal with this currently?	Very high energy 	Average energy 	No energy 
Q5: Feelings How do you feel about it ranging from positive/pleasant to negative/unpleasant?	Extremely pleasant and positive feelings 	Average or normal feelings towards it 	Extremely unpleasant and negative feelings 

Section 4: Reflective Comparison Across Challenges

General principles

Specific communication skills:

- Open-ended Questions: "What worries you most about moving with your current level of pain?".
- Affirmations: Recognizing the patient's effort, such as, "It's impressive that you completed your movement diary this week despite a flare-up".
- Reflections: Using double-sided reflections to manage ambivalence (e.g., "On the one hand, you're worried movement might damage your back, but on the other, you've noticed that walking actually helps you feel more flexible").
- Summarizing: Bringing together the patient's core points about their progress and barriers to ensure a shared understanding before moving forward.

Addressing Psychological Barriers

- Values-Informed Framing: Using orienting values like respect for limits and self-regulation as a reflective way to promote movement in populations where uncertainty and symptom variability are high.

- Building Self-Efficacy: Helping patients identify past successes by using questions around success to build their confidence in their ability to manage pain while remaining active.

- Information Exchange (Elicit-Provide-Elicit): Asking permission before providing education on how brief movement (Snacktivity) can actually suppress pain through descending pain inhibition.

Questions

"Looking at the main challenge, and thinking about other important challenges, which one feels the hardest right now?"
"Which one feels most changeable, even a little?"

This helps participants prioritise meaningfully.

Section 5: Motivational Interviewing–Informed Exploration

(With permission)

"Would it be okay if we talked a little more about one of these, just to understand it better?"

Focus first on:

- lowest hope **or**
- lowest energy **or**
- participant-chosen challenge

Exploring Meaning and Context

Open questions (MI-consistent):

- "When does this challenge tend to show up most in your day?"
- "Are there any situations or context which make it more difficult or challenging to overcome?"

Reflective statements (examples):

- "It sounds like this challenge shapes how safe movement feels."
- "You've been carrying this for a long time."
- "Its sound like there have been consistent challenges related to this."

Evoking Change Talk (without direction)

Importance

"On a scale from 0 (least important) to 10 (most important), how important does it feel to you to address this challenge in relation to Snacktivity?"
"What makes it that number and not a lower one?"

Confidence

“If you did decide to approach this challenge differently, how confident do you feel that you could do that?”

Hope-compatible question

“Have there ever been times when this challenge felt slightly less strong or less in control?”

Section 6: Linking Back to Snacktivity (Non-Prescriptive)

“How do you see this challenge fitting with the idea of very small, flexible bits of movement across the day?”

If participant introduces ideas:

- reflect and summarise
  If participant does not:
- do **not** suggest solutions

Section 7: Optional Forward-Looking Reflection

(Only if participant initiates or seems receptive)

“Based on what we’ve discussed, is there anything related to Snacktivity that feels even slightly possible or worth experimenting with?”

Avoid:

- goals
- targets
- plans unless participant leads

Section 8: Closing the Interview

“Is there anything important about your experience of Snacktivity that we haven’t talked about yet?”

Thank participant.

Appendix C

Weeks 2–6 MEAH-Informed, MI-Consistent 10-Minute Check-In Framework

Purpose of Weeks 2–6 Check-ins

- Maintain relational continuity
- Track *experience* rather than performance
- Notice shifts in meaning, emotion, acceptance, and hope
- Support reflection without steering change

Interviewer Positioning (Weeks 2–6)

These check-ins are:

- **Brief (≈10 minutes)**
- **Follow-ups**, not new assessments
- Focused on **how Snacktivity is being experienced**, not on progress or adherence

Interviewers should:

- Avoid evaluation ("how well did you do?")
- Avoid problem-solving unless invited
- Keep language soft, invitational, and reflective

Structure Overview

Section 1: Opening Orientation (1 minute)

"This is just a short check-in to see how your experience has been since we last spoke. There's no expectation to have done anything in particular - we're interested in how it's felt for you."

Section 2: Brief Safety and Health Check (1–2 minutes)

"Before we go further, can I just quickly check how things have been for you physically this past week?"

- "Any noticeable changes in pain compared to your usual?"
- "Any new symptoms, injuries, or medical care since we last spoke?"

✅ Only follow up clinically if required
✅ Otherwise acknowledge and move on

Section 3: Experiential Follow-Up (MEAH-Led) (3–4 minutes)

Open, global reflection

"Thinking about Snacktivity over the past week, what felt most noticeable or meaningful for you?"

Optional prompts (choose one if needed):

- "Did anything feel different this week compared to earlier on?"
- "Was there anything you found yourself thinking or feeling more strongly about?"

MEAH lens (internal, not labelled out loud):

- Meaning: *What does Snacktivity represent now?*
- Emotion: *What feelings show up?*
- Acceptance: *How is difficulty being held?*
- Hope: *Any shifts, up or down?*

Section 4: Light MEAH Check-In on Challenges (2–3 minutes)

Refer back to previously identified challenges only if relevant.

“Last time, we talked about [challenge]. How has that been showing up for you recently?”

If helpful, use MEAH-style focusing questions – may be show them the table as before:

- **Hope:**

  “How hopeful do you feel about this right now, compared to last time?”

- **Acceptance:**

  “How are you finding living alongside this at the moment?”

- **Energy:**

  “How much energy does dealing with this take from you right now?”

- **Emotion:**

  “How does thinking about this make you feel these days?”

✅ Do **not** re-rate numerically unless needed for consistency
✅ Focus on *change in experience*, not direction of change

Section 5: MI-Consistent Reflection and Evocation (2 minutes)

Use **reflections**, not questions, wherever possible.

Examples:

- “It sounds like this still feels challenging, but maybe less overwhelming than before.”
- “Even when it hasn’t changed much, you seem to be relating to it differently.”
- “You’re noticing things without feeling pressured to act on them.”

If change talk emerges, reflect it - do not amplify or steer.

Section 6: Closing and Gentle Forward Look (1 minute)

“Before we finish, is there anything about your experience this week that feels important to carry forward or keep in mind?”

Optional (only if participant initiates):

“Is there anything related to Snacktivity you’re curious to notice over the coming week?”

✅ Avoid goal-setting
✅ Avoid planning language

Section 7: Review of goals and option to reconsider a need for education

“Are you happy with the goals you initially set or have considered and if not can we set a new goals/habit plans where required”

“Are you happy with the educational content given in session 1 or would you like a reminder of any of the content?”

End of Check-In

“Thank you — I really appreciate you sharing how this has been for you.”

Appendix D

Qualitative Interview – Initial Interview (Baseline)

Timing: Prior to or at the very start of the Snacktivity study
Purpose:

- Explore baseline meanings of movement, pain, and Snacktivity
- Identify experiential challenges using a MEAH lens
- Establish context, not to initiate behaviour change

Interviewer Positioning (Reminder)

- Explore experiences, not provide advice or treatment
- Do not prescribe movement or set goals
- Use reflective listening throughout
- Seek permission before deeper exploration

Section 1: Introduction and Orientation

Opening question

"Before we begin, could you tell me a little about yourself and what led you to take part in this study?"

Follow-up prompts (if needed):

- "What interested you in this study?"
- "What were you hoping it might be like?"

Section 2: Meaning of Movement and Pain (Meaning)

"What does movement or physical activity mean to you at the moment, given your experience of low back pain?"

Prompts:

- "Has that meaning changed over time?"
- "Are there particular experiences that shaped how you feel about movement now?"

Section 3: Introducing Snacktivity (Meaning & Emotion)

"When you hear the idea of Snacktivity — small bits of everyday movement — what comes up for you?"

Prompts:

- “Does it feel familiar or unfamiliar?”
- “How does it sit emotionally — encouraging, uncertain, frustrating, neutral?”

Section 4: Challenges to Snacktivity (MEAH-Informed)

“When you think about trying to move in small, everyday ways, what feels most difficult or gets in the way right now?”

(Allow uninterrupted response.)

Optional structuring:

“Would it be okay to identify the main challenges that feel most important for you at the moment?”

Explore each challenge in turn using MEAH-consistent prompts:

- **Hope:**

  “How hopeful do you feel that this could change in any way?”

- **Acceptance:**

  “To what extent do you feel able to accept or live alongside this difficulty?”

- **Energy:**

  “How much energy does dealing with this take from you?”

- **Emotion:**

  “How do you feel emotionally when you think about this challenge?”

Section 5: Looking Forward (Without Goal-Setting)

“Is there anything about Snacktivity that feels even slightly possible, interesting, or worth noticing for you at this stage?”

✅ Avoid goals, targets, or plans unless participant initiates.

Section 6: Closing

“Is there anything important about your experience of movement, pain, or Snacktivity that we haven’t talked about yet?”

Thank the participant.

Qualitative Interview – Final Interview (End of Study)

Timing: After completion of the Snacktivity study
Purpose:

- Explore how experiences and meanings have evolved
- Understand perceived impacts and mechanisms
- Reflect on feasibility, acceptability, and future relevance

Interviewer Positioning (Reminder)

- Focus on experience and sense-making
- Avoid evaluating "success" or "adherence"
- Value change *and* non-change equally

Section 1: Overall Experience

"Looking back over the past few weeks, how would you describe your overall experience of taking part in this study?"

Prompts:

- "What stands out most to you?"
- "What felt most helpful or challenging?"

Section 2: Experience of Snacktivity Over Time (Meaning & Emotion)

"How has your experience or understanding of Snacktivity changed, if at all, since the beginning?"

Prompts:

- "Has the idea come to mean something different to you now?"
- "How did you feel about Snacktivity early on compared to later?"

Section 3: Challenges Revisited (MEAH Over Time)

"Earlier in the study, you mentioned some challenges around Snacktivity. How have those felt more recently?"

Explore selected challenges with:

- **Hope:** "Do these feel more or less changeable now?"
- **Acceptance:** "Has how you live alongside them shifted?"
- **Energy:** "Has the energy it takes changed?"
- **Emotion:** "How do you feel about them now compared to before?"

Section 4: Perceived Impacts and Learning

“Have you noticed any changes in how you relate to movement, pain, or your body since taking part?”

Prompts:

- “Changes in confidence or understanding?”
- “Changes in how you make sense of good or difficult days?”
- “Anything unexpected?”

✅ Emphasise meaning, not outcomes.

Section 5: Feasibility and Acceptability

“How did you find taking part in the study overall?”

Prompts:

- “What felt manageable or unmanageable?”
- “How were the weekly check-ins for you?”
- “Was there anything that could be done differently?”

Section 6: Looking Ahead (Non-Directive)

“Do you think the idea of Snacktivity has any place in your life going forward — in any form?”

✅ No encouragement or advice
✅ Accept all responses

Section 7: Closing Reflection

“If someone else with similar experiences were thinking about taking part in a study like this, what do you think they should know?”

“Is there anything else you’d like to add before we finish?”

Thank participant and close.