



PARTICIPANT INFORMATION SHEET

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Project Title: Older People's Comfort Level, when Using a Foot Warmer and Related Energy Use

You have received this information sheet because you have expressed an interest in taking part in a research study about thermal comfort and energy use among older people. The study is being carried out by a PhD student at the University of Leeds. Before you decide whether to take part, it is important that you understand why the research is being conducted and what your participation would involve.

Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part. On the following pages, we describe the purpose of the project, what you would be asked to do if you decide to take part, the time commitment involved, and the potential benefits and risks of taking part.

If you want more information or have any questions, please contact:

PhD student

Chunyu Tian

Email: ngtd0140@leeds.ac.uk

Main supervisor

Dr. Sally Shahzad

Email: s.shahzad@leeds.ac.uk

Co-supervisor

Dr. Alex Torku

Email: A.Torku@leeds.ac.uk

School of Civil Engineering

University of Leeds

Leeds

LS2 9J



Summary

You have received this information sheet because you have expressed an interest in taking part in a study about thermal comfort and energy use in older people at the University of Leeds. We have included a brief summary of the study below, followed by a detailed overview of the study procedures, requirements, and the potential risks and benefits.

This study aims to examine older people's comfort levels before and after using a foot warmer and related energy use at their residential environments.

We are looking for healthy older people aged 60 years and over, who live in their own homes.

During the study, small sensors will measure room temperature and humidity. For part of the study, you will use an electric foot warmer when you feel cold. The study involves three brief visits to your home, brief repeated questionnaires that take only a few minutes, and one brief interview. All procedures are designed to fit into your normal daily life. Participation is entirely voluntary, and you may withdraw at any time.

What is the purpose of this study?

The purpose of this study is to understand how using a **foot warmer** affects older adults' comfort, daily heating behaviours, and energy use at home during cold weather. Specifically, the study aims to examine:

1. How comfortable you feel in your home with and without using a foot warmer.
2. How before and after the foot warmer your heating habits and thermal behaviours change, such as adjusting clothing, moving to other spaces, or using room heating.
3. What is the impact of using a foot warmer on the overall energy use in the house.

By participating, you will be helping researchers better understand whether foot warmers are a safe, practical, and energy-efficient for older adults to stay warm during winter. This may contribute to developing more effective heating strategies to support older people in the future.



Why have I been invited?

You have been invited to take part in this study because you are aged 60 years or over, who is living in your own home. We are inviting people in this age group because being comfortable with the room temperature is important for health and wellbeing. We aim to recruit 40 participants to take part in a nine-day research in their own homes, while provided with a foot warmer.

Do I have to take part?

No, it is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and asked to sign a consent form. You are still free to withdraw at any time without giving a reason if you sign this consent form. While you are able to withdraw at any time without giving a reason, any data collected up until the point of your withdrawal will be retained and used in subsequent analyses unless you explicitly state that it should be removed and destroyed. You should contact the PhD student, Chunyu Tian (nqtd0140@Leeds.ac.uk), to withdraw any data.

What will happen to me if I take part?

The study lasts **nine days** and is divided into three phases.

Phase 1 (Day 1) is a preparation phase, the researcher will visit your home to introduce the study and review the Participant Information Sheet with them. After confirming understanding, you will sign the consent form and complete a short basic information questionnaire (e.g., birth year range, general temperature sensitivity). The researcher will then set up the room data collection device (i.e., temperature, humidity sensor). The device will be placed in the room where you usually spends most of their time and do not record images or sound. The researcher will explain the purpose of the device and how it works, as well as how to complete the daily questionnaires and what the next steps of the study will be.

Phase 2 (Days 2–8) is the experimental phase and consists of two conditions.

Before using a foot warmer (Days 2–4), you will complete a 3-day period baseline questionnaire. During this time, you will follow your normal daily routines while completing



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short daily questionnaires (3 times a day: morning, afternoon and evening) about your thermal comfort and related experiences.

On **Day 5**, the PhD student will return to visit and provide a demonstration of the foot warmer and explain how to use it safely and comfortably. The researcher will also explain how to complete the next set of questionnaires and the thermal log. You will have the opportunity to ask questions and confirm you understand the procedures for the next phase.

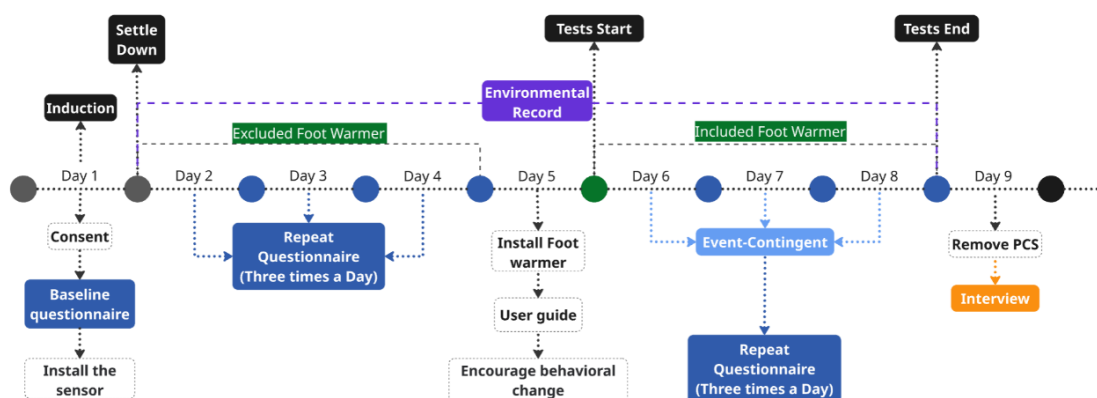
After using a foot warmer (Days 6–8), you will use the foot warmer for three consecutive days and be encouraged to use the foot warmer as much as possible, when you feel needed. As in the baseline period, you will complete daily questionnaire in this session. This questionnaire will be slightly different from the baseline version, as it will include additional questions about the use of the foot warmer and overall experience. You will also be asked to complete a thermal log whenever you use the foot warmer. The thermal log will record your current thermal sensation and thermal preference at the time of use. A small, circular temperature measuring device will be placed inside the foot warmer to measure the temperature change each time. This phase allows us to understand how using the foot warmer affects comfort, behaviour, and energy use.

Phase 3 (Day 9) is the closing phase.

On the final day, the researcher will visit and collect the data collection device and conduct a short semi-structure interview. This interview will explore your experiences, perceptions of the foot warmer, and any changes you noticed during the study.

In total, the study requires **3 brief visits to your home** and 3 or more brief daily questionnaires that take only a few minutes each. All activities will be arranged at times convenient for you. No travel is required, as all visits take place in your homes, and participation fits around normal daily routines. All procedures are designed to minimise inconvenience and ensure your comfort.

Figure 1. Number of study visits and time commitment per participant



The potential risks and benefits of taking part are described later in this document. Participation is entirely voluntary. You do not have to take part if you do not wish to, and you have the right to withdraw at any time by informing the researcher.

The next section of this Participant Information Sheet will explain the study procedures in more detail.

General conduct of the study:

Will I be reimbursed for my time?

Taking part in this study is voluntary. As a thank you for your time and contribution, you will receive a £20 voucher after you have completed all parts of the study. The voucher can be used in a range of well-known shops (e.g., supermarkets and online retailers). The £20 voucher will be provided only if you complete the required minimum contribution: full participation without the foot warmer session, at least one day of participation using the foot warmer session, completion of the semi-structured interview (mandatory), and sufficient questionnaire feedback (minimum two entries per day); you withdraw early or do not provide sufficient feedback (including not completing the interview) will not receive the £20 voucher. Further details about how to use the voucher will be provided to you at the end of the study. There is no cost to you for taking part in this study, and you do not need to travel, as the researcher will visit you in your home or at a location convenient for you.



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What are the possible benefits of taking part?

While there may be no direct personal benefit from taking part in this study, you can experience using a foot warmer that will be provided for you.

By taking part, you will be contributing to research that aims to improve understanding of older people, their comfort levels and behaviours to stay warm at home and related energy use. The findings of this study may help inform future heating strategies for older people.

What are the possible disadvantages and risks of taking part?

There are no major risks associated with participating in this study. However, a number of considerations have been taken into account in relation to your health and safety:

- The foot warmer used in this study is a commercially available, safety-certified device. The foot warmer is rechargeable (i.e., no cable connections to the mains, while in use to avoid the risk of fall) with separate heating pads for individual feet (for health and safety reasons to avoid the risk of fall), timer (e.g., 60 minutes maximum time usage per session to avoid overheating), and it has adjustable settings for heating levels (the upper level will be checked for health and safety reasons). You will be provided with clear instructions on how to use it safely, including when not to use it.
- You will be advised not to use the foot warmer if you feel unwell, uncomfortable, or notice any signs of overheating.
- The room temperature recording device placed in your home are small and non-intrusive. They do not record sound or images and will be positioned to avoid causing inconvenience or hazards.
- Completing questionnaires and taking part in the interview may take a small amount of your time.
- If at any point you feel uncomfortable or wish to stop participating, you may withdraw from the study immediately without giving a reason.

All study procedures have been designed to minimise risk and inconvenience and to ensure your comfort and safety throughout the study.



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How will we process participants data in line with General Data Protection Regulation (GDPR)?

In this research study we will use information from you. We will only use information that we need for the research study. Everyone involved in this study will keep your data safe and secure. We will also follow all privacy rules. At the end of the study, we will save some of the data in case we need to check it and for future research. We will make sure no-one can work out who you are from the reports we write.

How will we use information about you?

We will use mainly non-identifiable information collected from you for this research project. Mainly graphs and tables (demonstrating the overall collected data from all individuals) will be used in the research and publications with some quotations from the interviews (non-identifiable). Although identifiable information, such as your name, contact details, photos (without any identifiable features or persons), voice recordings, and interview transcripts are collected, all identifiable information will be securely stored on university approved platforms and only the researcher and her supervisors will have access to it. The researcher will use this information to check and ensure that the research is being done properly. Apart from the PhD student and her two supervisors, no one else will have access to any identifiable data. Coded data (anonymised) will be used for analysis and academic publications.

Assign a unique ID number to you

When entering the study, each participant will receive a unique participant ID number which will be used to identify all subsequent data collected from you. You will not be identifiable from this participant number alone, and we will use it so you cannot be identifiable from the data we collect.

Remove the information that can be used to identified you

The ID-log and recording transcripts will be stored for a maximum of 5 years after the study has ended. At that point, the ID-log and the audio recording of the interview will be permanently destroyed, while the anonymised (and non-identifiable) data will be kept. This procedure is in accordance with the General Data Protection Regulation (GDPR) and UK law and practice.



Store your data securely

All electronic forms of data will be protected with a password which can only be accessed by the researchers on the project. Identifiable data will be encrypted in a secure university approved platform. Data recorded on paper will be stored in locked drawers accessible by authorised researchers only.

What will happen to the study results?

All the contact information that we collect about you during the research will be kept strictly confidential and will be stored separately and securely from the research data. We will take steps wherever possible to anonymise the research data so that you will not be identified in any reports or publications.

Rights, withdrawal and discontinuation

Before entering the study, make sure that you have read this material carefully and feel free to ask additional questions. The study requires a 9 days' commitment in which all planned procedures and measurements are undertaken. However, participation in research is always entirely voluntary. Therefore, you can leave the study whenever you feel like it without giving a reason. Whether or not you take part in the study is entirely your decision and purely voluntary. You must notify the study researcher if you wish to stop taking part in the study. We may discontinue your participation shall any safety concerns arise, and you will always be informed about the reason for discontinuation.

What type of information will be sought from me and why is the collection of this information relevant for achieving the research project's objectives?

During this study, several types of information will be collected in order to understand older adults' thermal comfort experiences, daily heating behaviours, and the effects of using a foot warmer at home.



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- **Baseline data** will be collected at the start of the study. This will include your age range (year of birth range), housing type, home heating system type, and general sensitivity to temperature. This information will be used to support the development of an energy model after the study.
- **Questionnaire data** will be collected to understand how you feel in terms of thermal comfort, warmth, and cold sensitivity at different times of the day. These questionnaires help capture changes in comfort and behaviour both with and without using the foot warmer.
- **Event-based log** will be collected your feeling and preference in period of using foot warmer session. This information is important for understanding real-life behavioural responses to indoor thermal conditions.
- **Environmental data** (i.e., room temperature and humidity) will be collected using small data loggers placed in your home. These data provide objective information about the indoor environment and help contextualise your comfort experiences and behaviours.
- **Building energy-use data** may be collected with your consent. All heating energy usage data and energy bills within your home will be obtained with your consent. This information is relevant for assessing the energy implications of using a foot warmer compared with usual heating practices.
- **Interview data** will be collected to gain a deeper understanding of your experiences, preferences, and views on using the foot warmer in everyday life. With your permission, the interview will be audio recorded to ensure accurate and transcription (anonymised) and analysis. The audio recordings will be anonymised and stored securely, and no identifiable information will be used in any reports or publications.
- **Photographs of equipment installation** may be taken to document the placement of sensors and the foot warmer within your home. These photographs will focus only on the equipment, its location and immediate surrounding and will not include your face or any identifiable features. The photographs will be used solely for research documentation and analysis purposes.

Collecting these different types of information allows the research to combine subjective experiences with objective environmental, behavioural, and energy data. This is essential for



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achieving the project's objectives, which are to understand how older adults maintain thermal comfort at home and to explore whether a foot warmer can be a practical and energy-efficient way to support comfort during cold weather.

Ethical Approval

This study has received ethics approval from the (University of Leeds Research Ethics Committee). The study is being conducted in accordance with the University's ethical guidelines and relevant data protection regulations.

All participants will be asked to provide informed consent before taking part in the study.

If you have any concerns about the way this research is being conducted, or if you wish to make a complaint, you may contact the University of Leeds Research Ethics Committee using the details provided below.

Study funding

This project is self-funded, while some funding is provided by the University of Leeds. The funding covers all important processes, like executing the study, collecting data and the analyses specifically mentioned in this information sheet. This study will contribute to the PhD thesis of Miss Chunyu Tian.

Concerns or Complaints

Any complaint about the way you have been treated during the study will be addressed. Participants with any concerns or complaints should be advised to contact Chunyu Tian (nqtd0140@leeds.ac.uk) or her main supervisor, Dr Sally Shahzad Wyville (s.shahzad@leeds.ac.uk) and Dr Alex Torku (A.Torku@leeds.ac.uk) in the first instance. For further information, please follow the link: <https://dataprotection.leeds.ac.uk/research-participant-privacy-notice/>