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Does using sit-stand desks at work affect how many calories people burn and how much time they spend sitting over the entire day? A feasibility study

Submission date
19/11/2015

Recruitment status
No longer recruiting

Registration date
24/11/2015

Overall study status
Completed

Last Edited
24/01/2019

Condition category
Other

[X] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Prolonged and uninterrupted sitting can lead to the development of many diseases that cause premature death, such as Type 2 diabetes, cardiovascular diseases and some types of cancers. The amount of time people spend sitting is increasing in middle and high-income countries, with most sitting occurring at work. Office-based workers spend the majority of their working day sitting, which may put them at risk. One potential way of reducing workplace sitting is through the installation of sit-stand desks (i.e. adjustable desks which allow individuals to work in sitting or standing positions). However, key uncertainties remain with regards to the use of such desks, including their effect on the amount of energy people expend when using them and during the rest of the day, and their impact on sitting time in and outside of the workplace in the longer-term. We propose a study to address these uncertainties. To help us design this study, we are running this study to assess the feasibility and acceptability of the study procedures.

Who can participate?
Office-based employees of two companies in Cambridge UK that work at least 22 hours a week and spend at least 70% of their working week performing desk-related activities.

What does the study involve?
Five-hundred employees are invited to complete a survey to assess their interest in participating in a study on the use of sit-stand desks at work, their preferences for different desk types (full desks vs desk mounts) and their preferences regarding the location for the assessments (home vs workplace vs clinical research facility). The workspaces of 100 of those interested in participating are then assessed to see if they are suitable for the installation of sit-stand desk. 20 participants are randomly allocated to either receive a sit-stand desk to use at work for three months, or to be put onto a waiting list to receive a sit-stand desk three months later. The amount of energy expended, sitting time, as well as other outcomes relating to health and work performance, are assessed in 10 randomly selected participants. All participants are also interviewed about their experiences of using the desks and participating in the study.

Management representatives are also interviewed in order to explore the experiences of using sit-stand desks from the employers' perspective.

What are the possible benefits and risks of participating?
The findings will help us design a study to assess the impact of sit-stand desks at work, including their effect on energy expenditure and whether their use has effects outside the workplace. The findings from such a study will indicate whether sit-stand desks at work reduce the harm arising from prolonged sitting. We do not anticipate any negative consequences associated with participating in the study.

Where is the study run from?
The Behaviour and Health Research Unit and MRC Epidemiology Unit at the University of Cambridge, UK.

When is the study starting and how long is it expected to run for?
December 2015 to August 2016

Who is funding the study?
The study is jointly funded by the Behaviour and Health Research Unit and MRC Epidemiology Unit, University of Cambridge. The former is funded by a grant from the Department of Health Policy Research Programme.

Who is the main contact?
Prof Theresa Marteau

Contact information

Type(s)
Scientific

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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers

N/A

Study information

Scientific Title
Impact of sit-stand desks at work on energy expenditure and sedentary time: a feasibility study

Study objectives
Prolonged sitting time has been shown to increase the risk of obesity, weight gain, diabetes, some cancers, cardiovascular disease and premature mortality, as well as mental health problems. The time spent sitting is increasing rapidly on a global scale and is expected to continue to do so without intervention. One potential way of reducing workplace sitting is through the use of sit-stand desks (i.e. adjustable desks which allow individuals to work in sitting or standing positions). However, key uncertainties remain with regards to the use of such desks, including their effect on the amount of energy people expend when using them and during the rest of the day and their impact on sitting time in and out of the workplace in the longer-term. To address these uncertainties, we are planning a randomised controlled trial to assess the impact of sit-stand desks at work on energy expenditure and sitting time in the short and longer-term. Prior to conducting this trial we need to reduce some key uncertainties related to the study design. Here we aim to assess the feasibility and acceptability of the recruitment, allocation, measurement, retention and intervention procedures of the aforementioned randomised controlled trial.

Ethics approval required
Old ethics approval format

Ethics approval(s)
University of Cambridge Psychology Research Ethics Committee, 18/11/2015, ref: PRE.2015.100

Study design
A feasibility study consisting of four phases (Phases I-IV), each addressing different aims and employing a variety of methods for doing so, including:
1. A survey (Phase I)
2. Workspace auditing (Phase II)
3. A cross-over randomised component (Phase III)
4. Direct observations (Phase III)
5. Qualitative interviews (Phase IV)

Primary study design
Interventional

Secondary study design
Randomised cross over trial

Study setting(s)
Other

Study type(s)
Prevention

Participant information sheet
Not available in web format, please use the contact details below to request a patient information sheet

Health condition(s) or problem(s) studied
Prolonged sitting time

Interventions
This study comprises four Phases:

Phase I consists of an online survey aiming to explore:
1. Eligible participants' interest in participating in a trial aiming to assess the use of sit-stand desks at work
2. Their preferences for different desk types (full desks vs desk mounts)
3. Their preference regarding the location (home vs workplace vs clinical research facility) for the baseline and follow-up assessments.

Phase II consists of an assessment of eligible participants' workspaces to determine sit-stand desk installation suitability.

Phase III consists of a randomised component during which participants will be allocated either to the intervention or a waiting list control group. The intervention will comprise the provision of sit-stand desks at work for three months. Participants will be offered one of two desk types according to their preferences and workspace restrictions: desk mounts or full desks. To enhance desk use, participants will also be given:
1. A demonstration of how their desk works, delivered in person by a researcher
2. Written instructions on how to use the desks
3. Information on correct ergonomic posture
4. Information on the benefits of standing, reducing sitting and breaking up sitting time
5. Guidance on gradually building up standing time
6. Recommendations relating to the amount of time to increase standing and reduce sitting
7. Information on how the desks are used by others.

During Phase III all participants given sit-stand desks will be asked to complete short biweekly video and/or paper-based diaries to record the circumstances under which they choose to use the desks to stand (e.g. type of task performed, time of day), which will be used to explore the barriers and facilitators to standing. On occasion, participants will also be directly observed in their workplaces by a researcher to record their behaviour, including the different tasks undertaken while standing vs sitting.

Those allocated to the waiting list control group will receive the intervention three months later.

Phase IV consists of a qualitative component during which participants of Phase III will be interviewed about their experiences of using sit-stand desks and of taking part in the study. Management representatives from each participating organisation will also be interviewed to explore support for the use of sit-stand desks by companies and the impact installation of such desks has from the employers' perspective.

Intervention Type
Behavioural

Primary outcome measure

This feasibility study is not powered to detect changes in outcome measures but to assess the feasibility and acceptability of procedures planned for a full-scale trial.

Phase I
The following outcomes will be assessed via online questionnaire:
1. Proportion of eligible participants interested in taking part in a 3 month trial on the use of sit-stand desks at work (Outcome 1 of Phase I)
2. Proportion of eligible participants interested in taking part in a 6 month trial on the use of sit-stand desks at work (Outcome 2 of Phase I)
3. Demographic characteristics (Outcome 3 of Phase I)
3.1. Age
3.2. Gender
3.3. BMI
3.4. Salary band
3.5. Highest educational qualification
3.6. Position within company
3.7. Postcode of primary residence
4. Proportion of participants preferring desk mounts vs full desks (Outcome 4 of Phase I)
5. Proportion of participants preferring to be assessed at home vs work vs the clinical research facility (Outcome 5 of Phase II)

Phase II
1. Proportion of workplaces suitable for full desks and desk mounts assessed via workplace auditing and recording (Outcome 1 of Phase II)
2. Proportion of workspaces permitting participants' choice of desk to be installed (Outcome 2 of Phase II)

Phase III
1. Practicalities of delivering the intervention, assessed by recording (Outcome 1 of Phase III):
1.1. The time lapse between ordering the desks from the manufacturer and their delivery
1.2. Any permissions needed to install each desk type
1.3. The feasibility of training research staff to install desks
1.4. The feasibility of one person (a trained research assistant) installing each desk without help
1.5. The amount of time needed to install each desk
1.6. Any problems associated with delivering the desks to participants
1.7. Any problems installing each desk type
1.8. The practicalities associated with removing existing desks (applicable only when using full desks)
2. Circumstances and factors affecting desk use assessed via direct observations and diaries/logs (Outcome 2 of Phase III)
3. Proportion of participants dropping out between randomisation and the 3 month follow up (Outcome 3 of Phase III)
4. Trial-related outcomes, assessed at baseline (before randomisation) and at 3 months follow up (Outcome 4 of Phase III):
4.1. Sedentary behaviour measured using thigh-based accelerometer (activPAL) (Outcome 4.1):
4.1.1. Sitting time during a) working hours (workplace sitting time) and b) all waking hours (total sitting time) (outcome 4.1.a)
4.1.2. Sitting patterns (number of sit-to-stand transitions; sitting time accrued in prolonged bouts (>=30 minutes)) during a) working hours (workplace sitting patterns) and b) all waking hours (total sitting patterns) (outcome 4.1.b)
4.1.3. Physical Activity Energy Expenditure estimated via combined heart rate and movement

sensor (Actiheart) (Outcome 4.2)
4.2. Cardio-metabolic related outcomes (Outcome 4.3):
4.2.1. BMI calculated from weight and height (Outcome 4.3.a)
4.2.2. Weight measured using a scale (Outcome 4.3.b)
4.2.3. Height measured using a stadiometer (Outcome 4.3.c)
4.2.4. Body composition measured via bioelectric impedance spectroscopy device (Outcome 4.3.d)
4.2.5. Blood pressure measured via electronic sphygmomanometer (Outcome 4.3.e)
4.2.6. Waist and hip circumferences measured using a tape measure (Outcome 4.3.f)
4.2.7. Plasma total cholesterol, HDL and triglycerides and glycated haemoglobin (HbA1c) measured via non-fasting blood tests (Outcome 4.3.g)
4.3. Musculoskeletal discomfort measured using the Nordic Musculoskeletal Questionnaire (Outcome 4.3.h)
4.4. Ability to work, work productivity, presenteeism, absenteeism and job satisfaction measured using the Work Ability Index; Stanford Presenteeism Scale and Measure of Job Satisfaction (Outcome 4.3.i)
4.5. Domain-specific sedentary behaviour measured using the SIT-Q-7d questionnaire (Outcome 4.3.j)
4.6. Health symptoms, including neck pain, headache, back pain, fatigue, eye strain, and loss of concentration , measured using a checklist (Outcome 4.3.k)
4.7. Health-related quality of life measured using the Euro-Quality of Life 5 (Outcome 4.3.l)
4.8. Food and drink consumption measured using a daily food log (Outcome 4.3.m)

Phase IV
All outcomes assessed via qualitative interviews:
1. Experiences of using desks, including factors perceived as affecting desk use, issues with desk use (contextual, practical, emotive or other) and adverse consequences (work, health or otherwise related) (Outcome 1 of Phase IV)
2. Experiences of other intervention components (Outcome 2 of Phase IV)
3. Company representatives' perceptions of using sit-stand desks (Outcome 3 of Phase IV)
4. Acceptability of intervention (Outcome 4 of Phase IV)
5. Acceptability of assessments and burden (Outcome 5 of Phase IV)
6. Acceptability of study procedures (Outcome 6 of Phase IV)

Other measures
1. Proportion of participants dropping out between Phases

Secondary outcome measures
N/A

Overall study start date
15/12/2015

Completion date
10/08/2016

Eligibility

Key inclusion criteria

1. Office-based employees working for two organisations in Cambridge UK
2. Work at least 0.6 full-time (22 hours a week)
3. Spend at least 70% of a working week performing desk-related activities

Participant type(s)
Healthy volunteer

Age group
Adult

Sex
Both

Target number of participants
For Phase I, 500 eligible employees will be targeted. Phase II will involve 100 participants. Both Phases III and IV will involve 20 participants.

Key exclusion criteria
1. Are already using sit-stand desks
2. Have musculoskeletal disorders that make prolonged standing inadvisable
3. Have chronic illnesses that prevent prolonged periods of standing
4. Are planning to be absent from the workplace for more than 14 working days during the study period
5. Are pregnant

Date of first enrolment
15/12/2015

Date of final enrolment
01/03/2016

Locations

Countries of recruitment
England

United Kingdom

Study participating centre
Behaviour and Health Research Unit
University of Cambridge
Institute of Public Health
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Study participating centre
MRC Epidemiology Unit
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Sponsor information

Organisation
University of Cambridge (UK)

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Sponsor type
University/education

ROR
https://ror.org/013meh722

Funder(s)

Funder type
Government

Funder Name
Department of Health Policy Research Programme (UK)

Results and Publications

Publication and dissemination plan

The protocol for this study will be submitted for publication in a peer-reviewed journal with open access and then further disseminated to the research and policy communities through conference presentations, press releases and social media. The findings will also be disseminated in a timely way to policy makers through presentations and reports to the Department of Health.

Intention to publish date

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article	protocol	01/12/2016		Yes	No
Results article	results	01/03/2019	24/01/2019	Yes	No