The Influence of Personal Control Systems on Thermal Comfort, Physiology and Cognitive Performance in Moderately Drifting Temperatures

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To evaluate the influence of personal control systems on thermal comfort, physiology and cognitive performance in moderately drifting temperatures.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON50164

Source
ToetsingOnline

Brief title
Personal Control Systems in Moderately Drifting Temperatures

Condition

- Other condition

Synonym
thermal comfort and metabolic health

Health condition

thermal comfort and metabolic health

Research involving
Human

Sponsors and support

Primary sponsor: Medisch Universitair Ziekenhuis Maastricht
Source(s) of monetary or material Support: TKI

Intervention

Keyword: Environmental Temperature, Health, Personal control, Thermal comfort

Outcome measures

Primary outcome

Differences in thermal sensation, comfort, acceptance between the two

conditions.

Secondary outcome

To investigate the influence of a personal control system in moderate

temperature drift on energy metabolism, thermophysiological, and cardiovascular

parameters.

To investigate the influence of a personal control system in moderate

temperature drift on the air quality perception and cognitive task performance.

To investigate the underlying relation of control behavior and physiological

and psychological parameters.

To investigate the effect of thermal comfort and sensation on visual comfort

and perception

Study description

Background summary

In order to fulfil the demand of thermal comfort, current environmental design practise narrows the temperature into a small range. Less strict, dynamic, indoor conditions, however, pave the way to increased energy efficiency in

buildings. Moreover, excursions outside the thermal comfort range have been proven beneficial for metabolic health. Under drifting (dynamic) thermal conditions such exposures to mild cold or heat may be perceived as acceptable, but significant individual differences are evident. Acceptance of a drifting indoor temperature can potentially be extended using a personal control system.

Study objective

To evaluate the influence of personal control systems on thermal comfort, physiology and cognitive performance in moderately drifting temperatures.

Study design

This experiment has a cross-over design consisting of two conditions which will be conducted in two separate days. The control condition consists of a drifting temperature without a personal temperature control system and the other condition is a drifting temperature with a personal temperature control system. Measurements include thermal perception, body temperature, energy expenditure, blood perfusion, cardiovascular parameters, control behavior and cognitive performance.

Intervention

Participants will be exposed to a temperature drift ranging from 17 * to 25 * either with a personal control system or without a personal control system. When a personal control system is introduced, participants are allowed to freely control the equipment including a heating chair, a heating desk and a feet warmer.

Study burden and risks

This study carries no benefits for the subjects. It is not a therapeutic research and carries minor risks for the subjects. The major burdens consist of recurrent study visits, a moderate time commitment and exposure to warmer and cooler environments than usual. Subjects will reside within the respiratory research units of the MRUM and are not allowed to leave the room throughout the measurements. Furthermore, subjects are asked to regulate their eating and exercise habits one day before each measurement day of the study to limit external influences on the measurement of energy expenditure. This may be a small social and psychological burden.

The study will lead to novel insights into the influence of personal control systems and various health-related parameters such as blood pressure, heart rate and energy expenditure.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Caucasian race
Age 18-40 years
BMI between 18 and 27.5 kg/m2
Non-smoking
Steady dietary habits
Generally healthy, no medication use that interferes with metabolism.
Female participant who using Microgynon 30 or levonorgestrel/ehinylestradiol
Normal chronotype

Exclusion criteria

Cardiac problems and cardiovascular diseases, such as angina pectoris, cardiac infarction and arrhythmias Any medical condition requiring treatment and/or medication that might interfere with
the investigated parameters.
Unstable body weight (weight gain or loss >3kg in the past month)
Participation in another biomedical study within 1 month prior to the screening visit
Participants, who do not want to be informed about unexpected medical findings, or do not wish that their treating physician will be informed, cannot participate in this study
Presence of Raynaud's phenomenon
Jet lag or night shift work in the past 2 months
Color blindness
Participants who have undergone an operation on the gastrointestinal system in the past

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	29-11-2019
Enrollment:	18
Type:	Actual

Ethics review

Approved WMO Date:	11-07-2019
Application type:	First submission
Review commission:	METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL69769.068.19
Other	NL7757