

Investigating different methods of safety training for the construction industry

Submission date 03/12/2018	Recruitment status No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
Registration date 17/12/2018	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
Last Edited 16/02/2021	Condition category Injury, Occupational Diseases, Poisoning	<input type="checkbox"/> Individual participant data

Plain English summary of protocol

Background and study aims

This study aims to investigate virtual reality as a safety training method for the construction industry. It will also explore how training focused on human aspects in safety can increase safety knowledge and skills.

Who can participate?

Construction workers of both genders aged 20 and over, with at least 2 years of work experience.

What does the study involve?

This study involves four types of safety training processes. The participants will be randomly allocated to take part in one of the following types of safety training process: virtual reality, lecture-based, a combination of virtual reality safety training and training on human aspects in safety, a combination of lecture-based safety training with training on human aspects in safety. The participants will fill in questionnaires to investigate their attitudes and knowledge relating to safety before the training, immediately after the training and at 1 month after the training.

What are the possible benefits and risks of participating?

The possible benefits of the study include improved safety attitudes and safety knowledge among the participating workers. A possible side effect of virtual reality safety training is mild motion sickness.

Where is the study run from?

Finnish Institute of Occupational Health

When is the study starting and how long is it expected to run for?

January 2018 to January 2020

Who is funding the study?

The Finnish Work Environment Fund, the Finnish Institute of Occupational Health and the participating construction companies.

Who is the main contact?

Maria Tiikkaja, PhD, Researcher, Finnish Institute of Occupational Health, maria.tiikkaja@ttl.fi

Contact information

Type(s)

Scientific

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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers

117306

Study information

Scientific Title

Interventional four-arm randomized controlled trial to assess the efficacy of a virtual reality safety training and human factor learning method

Acronym

MoSaC

Study objectives

Virtual reality safety training more effectively increases safety knowledge, perceived behavioural control and safety motivation than traditional lecture-based safety training with a short-term follow-up. We also expect the HF tool to have beneficial effects on safety learning.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Finnish Institute of Occupational Health ethics committee, 28/09/2018

Study design

Interventional four-arm randomized controlled trial

Primary study design

Interventional

Secondary study design

Randomised controlled trial

Study setting(s)

Other

Study type(s)

Prevention

Participant information sheet

Not available in English. For more information, contact Mikko Nykänen, Researcher, Finnish Institute of Occupational Health, mikko.nykanen@ttl.fi

Health condition(s) or problem(s) studied

Occupational safety and health

Interventions

We will obtain written informed consent from all the study participants and will inform them of the potential risks and benefits of participating in the trial through an information sheet. No personal-level study data concerning the participants will be shared with employers or any third party during or after the study.

The study consists of four intervention arms into which study participants are randomly assigned.

1. The first arm consists of immersive virtual safety training. Virtual safety training will last approximately 30 minutes and includes the following steps: technical guidance, brief introduction to movement in virtual reality and safety training in a VR-learning environment. The

VR-learning environment guides study participants to identify work-related hazards, safety procedures and behavioral strategies to prevent accidents. Study participants will practice safety-related actions such as visual search for hazards, removing hazards, inspecting equipment and machinery for any defects and walking safely around or through the work zone.

2. The second arm consists of traditional lecture-based safety training. Lecture-based safety training will last approximately 30 minutes. Informational content will be equivalent in content to the VR-training. The difference will be that active learning process in VR-learning environment is missing and lecture-based training method will be used.

3. The third arm combines immersive virtual reality safety training and a modified version of a previously developed human factors safety training. Study participants will be guided to use a systematic checklist (HF-tool) to identify the role of human factors in safety-related processes, accidents and incidents. Human factors training will last approximately 2.5 hours and includes following the steps: Introduction to the content of HF-tool and basic concepts of human factors in safety, using HF-tool to analyze case-example of occupational accident. The human factors safety training guides study participants to identify background factors of accidents, analyze human contribution to safety and plan strategies to improve safety management.

4. The fourth arm combines lecture-based safety training with the HF-tool training.

We will use a validated questionnaire to assess the efficacy of intervention arms. Baseline data will be collected prior to the randomization into intervention arms. The first follow-up measure will be collected immediately after VR-safety training and lecture-based training. The second follow-up measure will be collected approximately 1 month after the baseline measurement. Data collection takes place at the workplaces and paper questionnaires are used

Intervention Type

Behavioural

Primary outcome measure

1. Safety locus of control
2. Safety self-efficacy
3. Perceived control over safety issues
4. Safety knowledge
5. Safety-related outcome expectancies

All primary outcome measures will be assessed by questionnaire at baseline, immediately after the end of VR-safety training/lecture-based safety training, and approximately 1 month after the baseline measurement.

Secondary outcome measures

1. Safety motivation assessed using questionnaires and previously developed study scales at baseline, immediately after the end of VR-safety training/lecture-based safety training and approximately 1 month after the baseline measurement.
2. Safety performance assessed using the safety performance scale at baseline and approximately 1 month after the baseline measurement.

Overall study start date

01/01/2018

Completion date

30/01/2020

Eligibility

Key inclusion criteria

Current inclusion criteria as of 21/08/2019:

1. Aged 20 and over
2. At least 2 years of work experience
3. Native Finnish language competence
4. Currently employed in the construction sector

Previous inclusion criteria:

1. Aged between 20 and 50 years
2. At least 2 years of work experience
3. Native Finnish language competence
4. Currently employed in the construction sector

Participant type(s)

Other

Age group

Adult

Sex

Both

Target number of participants

130

Total final enrolment

120

Key exclusion criteria

Does not meet inclusion criteria

Date of first enrolment

01/01/2019

Date of final enrolment

30/06/2019

Locations

Countries of recruitment

Finland

Study participating centre

Finnish Institute of Occupational Health
Topeliuksenkatu 41 B
Helsinki
Finland
0032

Sponsor information

Organisation

The Finnish Work Environment Fund

Sponsor details

Pohjoisesplanadi 21 A
Helsinki
Finland
00100
09 6803 3311
info@tsr.fi

Sponsor type

Other

Website

<https://www.tsr.fi/etusivu>

ROR

<https://ror.org/02v046k89>

Funder(s)

Funder type

Other

Funder Name

Työsuojelurahasto

Alternative Name(s)

Finnish Work Environment Fund, Työsuojelurahasto Arbetarskyddsfonden, Työsuojelurahasto | Helsinki

Funding Body Type

Government organisation

Funding Body Subtype

National government

Location

Finland

Funder Name

Finnish Institute of Occupational Health

Funder Name

STARA

Funder Name

YIT

Funder Name

SRV

Funder Name

NCC

Funder Name

Lujabetoni

Funder Name

Voimatel

Results and Publications

Publication and dissemination plan

To be published in a peer-reviewed journal.

Intention to publish date

30/06/2020

Individual participant data (IPD) sharing plan

The datasets generated and analyzed during the current study will not be available due to agreement with study participants.

IPD sharing plan summary

Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article	protocol	01/08/2020	15/01/2021	Yes	No
Results article	results	01/12/2020	16/02/2021	Yes	No