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# The effect of a dynamic overlay mattress on chest compression quality during cardiopulmonary resuscitation

| Submission date | Recruitment status | [X] Prospectively registered |
|---|---|---|
| 15/09/2020 | No longer recruiting | [_] Protocol |
| **Registration date** | **Overall study status** | [_] Statistical analysis plan |
| 17/09/2020 | Completed | [X] Results |
| **Last Edited** | **Condition category** | [_] Individual participant data |
| 08/11/2021 | Circulatory System | |

## Plain English summary of protocol

Background and study aims
Adult cardiac arrest both in- and out-of-hospital is common and associated with high mortality and morbidity. High-quality cardiopulmonary resuscitation (CPR) is important for patient survival and for a decent neurological outcome after a cardiac arrest. Therefore, It is important to identify factors that can affect CPR quality.

This study investigates the effect of a dynamic mattress overlay on the quality of cardiac massage during resuscitation as the certainty of the available evidence is still very low.

Who can participate?
Students enrolled in one of the nursing education programs (offered by the participating centres) who have completed basic CPR training and their first year of nursing education.

What does the study involve?
Students have to complete a 2-minute cardiac arrest CPR scenario on a manikin. For a random sample of half of the students, the manikin will be on a bed with a memory foam mattress alone, and for the other half, the manikin will be on a bed with a memory foam mattress and dynamic overlay mattress combination.

What are the possible benefits and risks of participating?
Participation in this study offers a chance to participate in the development of evidence-based nursing. No risks are anticipated.

Where is the study run from?
Odisee University College and TI Sint-Carolus (Belgium)

When is the study starting and how long is it expected to run for?
From September 2020 to November 2020

Who is funding the study?
Investigator-initiated and funded

Who is the main contact?
Tim Torsy
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# Contact information

### Type(s)
Scientific

### Contact name
Mr Tim Torsy

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# Additional identifiers

### Protocol serial number
BPWD1920

# Study information

### Scientific Title
The effect of a dynamic overlay mattress on chest compression quality during cardiopulmonary resuscitation: A randomised controlled trial

### Study objectives
A dynamic overlay mattress has a negative impact on chest compression quality during CPR

### Ethics approval required
Old ethics approval format

### Ethics approval(s)
Following external advice, the approval of the study by a medical ethics review committee was waived as this is manikin-based simulation research.

### Primary study design
Interventional

### Study design
Single-blinded, two-arm, parallel-group randomized controlled trial

### Study type(s)
Other

### Health condition(s) or problem(s) studied
Chest compression quality in patients who had a cardiac arrest

### Interventions
In this manikin-based simulation study, participants (students from two nursing education programs) are going to be allocated to one arm of the two-arm parallel-group design using block randomisation. The students will be blinded to the allocation. Student body height (in cm), body weight (in kg) will be collected.

The students will be assessed for the quality of chest compressions during adult cardiopulmonary resuscitation (CPR), in a 2-minutes cardiac arrest CPR scenario, on either:
1. A manikin in bed on a memory foam mattress (control group)
2. A manikin in bed on a dynamic overlay mattress on top of a memory foam mattress (intervention group)

### Intervention Type
Device

### Phase
Not Applicable

### Drug/device/biological/vaccine name(s)
CPR simulation feedback device

### Primary outcome(s)
1. Chest compression rate is measured in the total number of compressions per min using a feedback device
2. Sternum-to-spine chest compression depth is measured in mm using a feedback device
3. Hand positioning is measured in scores out of 100 using a feedback device

### Key secondary outcome(s)
1. The predictive effect of body height (cm), body weight (kg), hand positioning (scores out of 100), and mattress type (dynamic overlay mattress or not) on depth and frequency of chest compressions measured using a feedback device

### Completion date
30/11/2020

## Eligibility

### Key inclusion criteria

1. Enrolled as a student in one of the two selected nursing education programs
2. Aged ≥18 years
3. Successfully completed a basic CPR training
4. Successfully completed first year of nursing education

### Participant type(s)
Health professional

### Healthy volunteers allowed
No

### Age group
Adult

### Lower age limit
18 Years

### Sex
All

### Total final enrolment
70

### Key exclusion criteria
Inability to use normal muscle strength in arms and trunk at the time of data collection due to an injury

### Date of first enrolment
28/09/2020

### Date of final enrolment
02/10/2020

## Locations

### Countries of recruitment
Belgium

### Study participating centre
**Odisee University College**
Hospitaalstraat 23
Sint-Niklaas
Belgium
9100

### Study participating centre

**TI Sint-Carolus**
Hospitaalstraat 23
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Belgium
9100

# Sponsor information

**Organisation**
University College Odisee

**ROR**
https://ror.org/02c89h825

# Funder(s)

**Funder type**
Other

**Funder Name**
Investigator initiated and funded

# Results and Publications

**Individual participant data (IPD) sharing plan**
The datasets generated during and/or analysed during the current study are/will be available as an SPSS dataset at any time upon request from the researchers (Tim Torsy - tim.torsy@odisee.be). Datasets are anonymized, are not intended for IPD sharing and wil only made available based on a good, well-founded motivation. Datasets will only be made available until the next major update of the ERC guidelines for adult basic life support and automated external defibrillation.

**IPD sharing plan summary**
Available on request

**Study outputs**

| Output type | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|---|---|---|---|---|---|
| Results article | | 21/04/2021 | 08/11/2021 | Yes | No |
| Participant information sheet | | 16/09/2020 | 08/10/2020 | No | Yes |