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The use of technology to improve clinical practice in nursing education

Submission date
23/02/2021

Recruitment status
No longer recruiting

Registration date
25/02/2021

Overall study status
Completed

Last Edited
24/02/2021

Condition category
Other

[_] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[_] Record updated in last year

Plain English summary of protocol
Background and study aims
Nursing students must demonstrate a strong ability in critical thinking to meet the demands of the nursing profession. This ability must be learned and practiced, and nursing students can best do that in clinical practice. In Norway, nursing students spend a great part of their education in clinical practice, in which registered nurses, called nurse preceptors, guide the students and provide a foundation for the development of critical thinking. Clinical practice can be challenging for students, because, nurse preceptors may lack experience in guidance and nurse educators are not involved in the daily guidance of students. Hence, communication between nursing students, nurse preceptors and nurse educators may be limited. Technological tools have the potential to improve the guidance of nursing students and thus stimulate the development of critical thinking in new ways, but it is currently unclear which technological tools should be used and how they should be used to support nursing students in developing their critical thinking ability.
This study aims to compare the effectiveness of guiding nursing students with technological support (i.e., a mobile application and virtual meetings in the intervention group) against guidance as usual (i.e., a control group without technology). The outcomes to be measured include self-efficacy, the clinical learning environment, the effects on critical thinking and the acceptance of new technology.

Who can participate?
First-year undergraduate nursing students in clinical practice at Lovisenberg Diaconal University College (LDUC), Oslo, Norway.

What does the study involve?
First-year undergraduate nursing students in clinical practice will be randomly assigned to either a control group or the intervention group. Both groups will receive daily guidance from a nurse preceptor during their clinical practice, and the participants in the intervention group will additionally use an application called Technology Optimised Practice Process in Nursing (TOPP-N) as a guidance tool along with virtual meetings with the nurse educator.
The students in the intervention group will use the mobile application daily for 6 weeks, and their levels of critical thinking, self-efficacy, perception of the clinical environment and acceptance of technology will be measured by self-reported tests and questionnaires.

Measurements will be taken before their clinical practice, upon completion and then 3 and 9 months after the last day of clinical practice.

What are the possible benefits and risks of participating?
The benefits for participants include structured, systematic guidance in clinical practice, stimulation of the development of critical thinking, reflection on their own learning and improved communication with nurse preceptors and nurse educators. There are no risks associated with participation.

Where is the study run from?
Lovisenberg Diaconal University College (LDUC) (Norway)

When is the study starting and how long is it expected to run for?
September 2019 to April 2023

Who is funding the study?
1. Norwegian Agency for International Cooperation and Quality Enhancement in Higher Education (DIKU) (Norway)
2. Lovisenberg Diaconal University College (LDUC) (Norway)

Who is the main contact?
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Contact information

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Scientific

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Additional identifiers

Protocol serial number
AKTIV-2018/10101

Study information

Scientific Title
Technology-supported guidance to increase flexibility, quality and efficiency in the clinical practicum of nursing education

Acronym
TSGM

Study objectives
Hypothesis (primary outcome):
H1. Participants in the intervention group will demonstrate a higher overall level of critical thinking than participants in the control group at post-test and at 3- and 9-month follow-up.

Hypotheses (secondary outcomes):
H2. Participants in the intervention group will have higher overall levels of self-reported self-efficacy than participants in the control group at post-test and at 3- and 9-month follow-up.
H3. Participants in the intervention group will have a more favourable impression of their clinical environment than participants in the control group at post-test.
H4: Participants in the intervention group will express a greater acceptance of new technology at post-test than at pre-test.
H5: Participants in the intervention group will demonstrate a stronger use of self-regulatory and metacognitive processes than the control group at post-test and at 3- and 9-month follow-up.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 21/12/2020, Norwegian Centre for Research Data (NSD, Harald Hårfagres gate 29, N-5007 Bergen, Norway; +47 (0)55 58 21 17; personverntjenester@nsd.no), ref: 338576

Primary study design
Interventional

Study design
Single-center interventional two-armed individually randomized controlled trial

Study type(s)
Other

Health condition(s) or problem(s) studied
Ensuring the quality of clinical practice in nursing education

Interventions
This is a single-center interventional two-armed (intervention and control group) individually randomized controlled trial.

Intervention group:
The intervention is delivered as an application, technology-optimized practice process in nursing (TOPP-N), that is accessible from mobiles phones, tablets and internet browsers. Participants fill out reports daily before starting their shift in clinical practice and consequently before completing their daily shift. In these reports, they plan, reflect upon and evaluate their need for learning and guidance and plan their learning activities accordingly. Nurse preceptors give daily feedback to students through the application according to their planned and completed learning activities.
The participants' understanding of their need for guidance as well as the nurse preceptors' understanding of the participants need for guidance is registered daily in the application. If the application detects a difference between a participant's and a nurse preceptor's understanding of the need for guidance, it alerts the participant and nurse preceptor about the difference. The alert allows participants and nurse preceptors to review and discuss the reason for the discrepancy in their understanding. If a difference is detected for more than four days, the nurse educator is also prompted and can intervene if necessary. Additionally, TOPP-N provides a digital summative assessment of student performance via an Assessment of Clinical Education (AssCe) that is part of the application. Students, nurse preceptors and nurse educators evaluate student performance using AssCe during a virtual meeting.

The duration of the intervention is 6 weeks.

Control group:
In the control group, the clinical practicum period is performed as usual.

Randomization:
Participants are randomized to the intervention or control group by an independent administrative worker at Lovisenberg Diaconal University College (LDUC).
Informed consent, questionnaires and tests will be collected through Questback (person-based feedback platform) and custom testing system (Insight Assessment) at various time points: at pre-test, at post-test (after 6 weeks of clinical practice) and 3 and 9 months after a participant's last day of clinical practice.
The participants will not receive their individual results of questionnaires and tests.

Intervention Type
Other

Primary outcome(s)

Critical thinking measured by the Health Sciences Reasoning Test (HSRT) at pre-test, post-test and 3- and 9-month follow-up

Key secondary outcome(s)
1. Self-efficacy measured by the Self-Efficacy in Clinical Performance Scale (SECP) at pre-test, post-test (after 6 weeks of clinical practice) and 3- and 9-month follow-up
2. Perception of clinical environment and supervision measured by the Clinical Learning Environment, Supervision and Nurse Teacher Scale (CLES+T) at post-test (after 6 weeks of clinical practice)
3. Acceptance of technology measured by the Technology Acceptance Model (TAM) at pre-test and post-test (after 6 weeks of clinical practice)
4. The Self-Regulation and Metacognition in Clinical Practice (SMCP) test at 1 week after the start of the intervention and at post-test (after 6 weeks of clinical practice)

Completion date
01/04/2023

Eligibility

Key inclusion criteria
1. First-year undergraduate nursing students at Lovisenberg Diaconal University College (LDUC)
2. Nursing students who are to enter their first clinical practice period
3. Willing to electronically fill in Norwegian questionnaires
4. Willing to give signed informed consent
5. Willing to attend the preparatory course on the use of Technology Optimised Practice Process in Nursing (TOPP-N) application

Participant type(s)
Other

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Key exclusion criteria
1. Second- and third-year undergraduate nursing students at Lovisenberg Diaconal University (LDUC)
2. Undergraduate nursing students at other educational institutions than LDUC
3. Postgraduate nursing students at LDUC

Date of first enrolment
26/01/2021

Date of final enrolment

19/04/2021

Locations

Countries of recruitment
Norway

Study participating centre
Lovisenberg Diaconal University College (LDUC)
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Sponsor information

Organisation
Lovisenberg Diakonale Høgskole

ROR
https://ror.org/015rzvz05

Funder(s)

Funder type
Government

Funder Name
Direktoratet for internasjonalisering og kvalitetsutvikling i høgare utdanning

Alternative Name(s)
Norwegian Agency for International Cooperation and Quality Enhancement in Higher Education, Direktoratet for høyere utdanning og kompetanse | HK-dir, The Directorate for Higher Education and Skills, Direktoratet for høyere utdanning og kompetanse, DIKU

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location

Norway

Funder Name
Lovisenberg Diakonale Høgskole

Alternative Name(s)
Lovisenberg Diaconal University College, Lovisenberg Diaconal College, LDH

Funding Body Type
Private sector organisation

Funding Body Subtype
Universities (academic only)

Location
Norway

Results and Publications

Individual participant data (IPD) sharing plan
The data-sharing plans for the current study are unknown and will be made available at a later date.

IPD sharing plan summary
Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article	protocol	23/06/2020	23/02/2021	Yes	No