Official Title: Pioneering Video-Based Neurocritical Care Education in Palestine: A Randomized Controlled Trial on Nursing Students' Knowledge, Attitude, Practice, and Self-Confidence Toward External Ventricular Drainage

ClinicalTrials.gov Identifier: Pending NCT Registration

Document Type: Study Protocol (with Integrated Statistical Analysis Plan)

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Date: Oct 2025

Study Protocol

1. Background and Rationale

External Ventricular Drainage (EVD) is a lifesaving neurosurgical procedure that monitors intracranial pressure and drains cerebrospinal fluid in patients with acute brain injury, hydrocephalus, or subarachnoid hemorrhage. Despite its importance, undergraduate nursing education in Palestine rarely includes practical or evidence-based EVD training. This educational gap leads to low confidence and preparedness among nursing students entering neurocritical care environments. Video-based learning has emerged as an effective method to improve cognitive and psychomotor skills through visual engagement and standardized instruction.

This randomized controlled trial (RCT) aims to evaluate the effectiveness of a theory-informed, video-based educational intervention compared to traditional flashcard learning in improving nursing students' knowledge, attitude, practice, and self-confidence toward EVD care.

2. Study Objectives

1. To assess the impact of video-based education on EVD-related knowledge, attitude, practice, and confidence among nursing students.
2. To compare post-intervention improvements between the video-based and flashcard-based learning groups.
3. To explore the correlation between baseline characteristics and post-intervention outcomes.

3. Study Design

A single-blind, parallel-group randomized controlled trial with a 1:1 allocation ratio.

4. Setting and Participants

The study will be conducted at Modern University College, West Bank, Palestine, during the Spring 2025 semester. Participants are third- and fourth-year nursing students enrolled in the critical care course who have not yet completed the nervous system module.

Inclusion Criteria:

- Active enrollment in the critical care course.
- Willingness to provide informed consent.
- Availability for both pre- and post-test assessments.

Exclusion Criteria:

- Prior clinical experience or coursework related to neurocritical care.
- Participation in another educational study during the same period.

5. Sample Size

Based on a power analysis (effect size $d = 0.6$, $\alpha = 0.05$, power = 0.80), a minimum of 45 participants per group (total N = 90) is required to detect statistically significant differences in post-test scores.

6. Randomization and Blinding

Participants will be randomly assigned using a computer-generated block randomization list (block size = 4). Group allocation will be concealed in sealed opaque envelopes. The study is single-blind: participants will know their group assignment, but assessors analyzing the data will be blinded.

7. Intervention

- **Intervention Group:** A 57-minute theory-informed video module demonstrating EVD procedures, nursing care principles, and infection control practices.
- **Control Group:** A flashcard-based learning session of equivalent duration covering identical content without audiovisual elements.

8. Outcome Measures

1. **Knowledge:** 11-item multiple-choice questionnaire (score range 0–11).
2. **Attitude:** 6-item Likert scale (1–5 per item).
3. **Practice:** 23-item self-reported checklist (1–5 per item).
4. **Confidence:** 10-point visual analogue scale (0–10).

9. Data Collection Procedure

Pre-test assessments will be conducted immediately before the intervention. Post-tests will be administered one week after completion. Demographic and baseline characteristics (age, gender, academic level, GPA) will also be collected.

10. Statistical Analysis Plan

Data will be analyzed using SPSS version 27.

- **Descriptive statistics:** Mean, standard deviation, frequency, and percentage.
- **Inferential statistics:**
    - Paired t-tests to assess within-group pre- and post-test changes.
    - Independent t-tests to compare between-group differences.
    - ANCOVA to adjust post-test outcomes for baseline values.
    - Effect sizes (Cohen's d) and 95% confidence intervals will be calculated.
- Significance threshold set at $p < 0.05$.

11. Ethical Considerations

Ethical approval will be obtained from the Institutional Review Board (IRB) of Modern University College. Participation is voluntary, and informed consent will be obtained electronically. Data confidentiality will be maintained, and all identifiers will be removed prior to analysis.

12. Expected Outcomes

The video-based educational intervention is expected to produce significantly greater improvements in knowledge, practice, and confidence compared to the flashcard group, with comparable attitudinal changes. The findings will support the integration of multimedia tools into neurocritical care education in undergraduate nursing curricula.

13. Dissemination Plan

Findings will be disseminated through peer-reviewed publications, conference presentations, and integration into nursing education policy recommendations. Results and supporting documents will be publicly available on ClinicalTrials.gov following study completion.