Title: Applying videos feedback Learning to Improve Skills Performance of Physiotherapy Interns

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Background

This project uses self-practicing videos feedback to learn to improve the skill performance of physiotherapy interns. For traditional physiotherapy intern courses, teachers will conduct core courses and demonstrate teaching, but students are less familiar with the application of skills, even if adding practice course. The learning outcomes of the course are still not good in skill performance. By recording the self-practicing videos, the teacher uses observation and feedback to let the physiotherapy interns know whether the posture of the individual case, the fixed position of the limbs are appropriate, the resistance given and whether the verbal instruction is correct, and based on the evaluation outcomes to observe the students' learning status and clinical thinking ability can improve the skill performance and learning satisfaction.

Methods

This study is divided into three randomized controlled experiments, recruiting physical therapy interns. During the internship period, participants will execute various station-based internships according to the instructional plan. Prior to the trial, the project lead will explain the research plan to students, and willing participants will sign an informed consent form before participating in the study. Interns who are not willing to participate will still be involved in course design but will not undergo assessment tests.

1. **Participants**

Inclusion criteria for physical therapy interns require individuals to be over 20 years old. Exclusion criteria include individuals unwilling to participate in the study.

The study uses sealed envelopes for random allocation to ensure evaluator blinding. Evaluators are unaware of which group each participant is assigned to, with an internal reliability of 0.93. Participants are divided into two groups: practice group and video feedback group, each consisting of 45 individuals.

2. **Interventions**

2.1 Practice Group: Participants in this group engage in the traditional core course (1-hour lecture on upper limb soft tissue differential diagnosis and assessment techniques. They have the opportunity to observe teacher demonstrations, and the course content and instructional

demonstrations are consistent and delivered by the same therapist), followed by a 20-minute practical session where they pair up for mutual hands-on practice. The assessment of upper limb soft tissue operations takes approximately 4 minutes per session, allowing for approximately 5 practice sessions.

2.2 Video Feedback Group: Participants receive the traditional core course along with a 20-minute video feedback session. Initially, a therapist records students' assessment techniques in action, capturing the dynamic process on video. The recorded video is then played on a screen for both the course teacher and students to watch together. Participants can annotate specific actions during the viewing, and the course teacher facilitates a reflective discussion where participants observe and identify any issues or correct actions as expected. The teacher provides feedback on areas of improvement in the action process for further practice. The self-viewing of the recorded video serves as a valuable tool for enhancing the skill performance of physical therapy interns

3. **Outcome Measures**

3.1 Objective Structured Clinical Examination (OSCE): Evaluators utilize a detailed, operationally defined standardized checklist to assess the performance of examinees in a structured clinical skills assessment. OSCE is a performance-based testing method that objectively evaluates clinical skills in simulated clinical scenarios using molds and standardized patients. This instructional design aims to aid students in learning and understanding their learning outcomes, evaluating the knowledge, skills, and attitudes of the examinees through a performance-based testing approach.

The scoring sheet includes an standardized checklist and an overall performance assessment. The standardized checklist comprises 15 items, with results presented in percentages, where higher scores indicate better performance. The overall performance assessment ranges from 5 points (excellent) to 1 point (poor).

Time Frame: pre-test, within 1 week post test, 3-month follow-up.

3.2 Mini-Clinical Evaluation Exercise (Mini-CEX): The Mini-CEX focuses on the performance of interactions with patients. Clinical instructors can use it to directly observe the interaction between learners and patients, conduct a simple assessment of the Mini-CEX, and provide direct

feedback to the learners. Clinical instructors can assess a specific aspect (medical interview, physical examination, operational skills, counseling and health education, clinical judgment, organizational efficiency, humanitarian professionalism) each time.

The assessment consists of 7 items, with scores ranging from 1 to 9 points each. The total score ranges from 7 to 63 points, with higher scores indicating better performance.

Time Frame: pre-test, within 1 week post test, 3-month follow-up.

3.3 Direct Observation of Procedural Skills (DOPS): Clinical instructors assess and provide feedback on the procedural skills of participants, ensuring effective learning. Clinical instructors evaluate and provide feedback on the procedural skills of the examinee. Each clinical procedural skill is assessed and feedback is provided to ensure learning effectiveness.

The assessment consists of 10 items, with scores ranging from 1 to 6 points each. The total score ranges from 10 to 60 points, with higher scores indicating better performance.

3.4 Course Satisfaction: Understand your satisfaction with various arrangements of this course activity, including speakers, lecture content, and related activities.

The assessment consists of 12 items, with scores ranging from 1 to 5 points each. The total score ranges from 12 to 60 points, with higher scores indicating higher satisfaction.

4. Statistical analysis

All analyses were conducted via the IBM SPSS statistical software, version 23.0. The continuous data were presented in means and standard deviations, and number and percentage for categorical data. Independent t-test was used to compare continuous data and chi-square for categorical data. Inferential statistics were performed using a generalized estimating equations to estimate the intervention effectiveness of the simulation course. The significance level was set to 0.05. Intention-to-treat (ITT) analysis is an approach to managing dropouts and missing data. Sample size was calculated using G*Power to compare differences between variables and independent means. A power of 80% was used, with medium effect size (Cohen's d) of 0.5, and alpha significance level of 5%. This resulted in a sample size of 54 students (Rotthoff, 2014).