Effective teaching of manual skills to physiotherapy students. A Randomized Clinical Trial.

Reference:
Rossettini G\(^1\), Rondoni A\(^1\), Palese A\(^2\), Cecchetto S\(^3\), Vicentini M\(^4\), Bettale F\(^5\), Furri L\(^6\), Testa M\(^1\).
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Tags
Clinical domain: Medical Expert
Educational domain: Teaching and learning
Undergraduate (medical school)

Background
**This is an exclusive, early access to a Medical Education (the journal) article pre-publication. The E-i-C of Medical Education provides a number of articles for consideration for review to the KeyLIME hosts. We have complete editorial freedom in the review. We declare no conflicts of interest.**

Sometimes health professional education can be embarrassing. Despite the maturity of the field, there are occasions when a study can highlight shared assumptions among clinician educators. For example, what is the most effective way to teach a technical skill? What’s that? You never teach technical skills in your practice? Yeah right ;) See... despite the ubiquity of teaching technical skills, the championing of theory and evidence to inform best practices, I must admit, I’m not sure what the right answer is for this question. But, don’t worry. The Key Literature in Medical Education podcast has got your back.
Purpose

"To date, despite the relevance of manual skill laboratories in physiotherapy education, evidence on effectiveness of different teaching methods is limited. "Peyton’s four-step" and “See one, do one” approaches were compared for their effectiveness in teaching manual skills.”

Type of paper

Research: RCT

Key Points on the Methods

There was ethics approval.

A cluster randomized single blind control trial was conducted.

Thirty-nine third year physiotherapy students without previous experience in manual therapy (spinal manipulation) were taught cervical spine mobilization.

- A power calculation suggests that 36 students are required to observe a medium/large effect.

Control group: “See one, do one.”

- Conceptual introduction (anatomy etc.)
- Observe the skill with each step described by the expert
- No opportunity for learner practice
- Time was equivalent between control and intervention

Intervention group: “Peyton’s four step method”

- Demonstration (learner observes the procedure at normal speed)
- Deconstruction (expert repeats the procedure while describing the sequence of steps)
- Comprehension (learner guides the expert in the sequence of steps requiring: reflection on information from deconstruction, organization of their thoughts, active verbalization and facilitated integration of new with existing knowledge)
- Performance (the learner independently performs the procedure with supervision)

A checklist to score performance was developed using a Delphi method (because no validated scoring system exists in the literature.) Internal consistency and inter-rater agreement was high when the checklist was used on a group of subjects not included in the study.

Performance was captured on digital video immediately after the teaching session and at one week and one month follow-up. Three blinded assessors scored performance.
**Key Outcomes**

There was no significant difference in demographics between groups.

Average performance was better in the intervention group than the control ($F_{1,111} = 35.914, p<0.001$) and across both immediate, one-week and one month intervals.

Degradation of performance increased over time without statistically significant difference between groups ($F_{2,111}=0.275, p=ns$)

Time for teaching was not different between groups.

Time for performance was less in the intervention group at all testing intervals.

Self-reported learner satisfaction was higher in the intervention group.

**Key Conclusions**

The authors conclude...

*The effectiveness of "Peyton’s four-step approach" on performance is superior to that of “See one, do one” in physiotherapy students’ training in C1-C2 passive mobilisation in the short-, medium and long- terms. Peyton’s approach is also capable of reducing the time required for students to perform the procedure, both at the end of the skill laboratories and over time, and to achieve higher student satisfaction.”*

**Spare Keys – other take home points for clinician educators**

1. To be transparent, there are previous studies comparing Peyton’s four step method, but none outside of medicine. While I’m not convinced that the professional context (medicine vs. physiotherapy) has any bearing on technical skills learning, I think this study improves the generalizability of the evidence to support Peyton’s framework. Perhaps it is time for a meta-analysis, and to resolve this issue once and for all.
2. The authors include the self-reported learning styles of study participants. For the KeyLIME take on this see [Episode 51](#).
3. The authors are careful to control for “handed-ness” in the study, a key feature in their design of teaching a technical skill. I have not seen this attention within medicine, perhaps it is something that should be considered in greater detail.