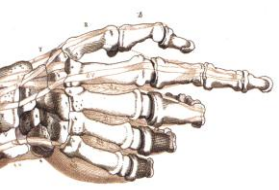


Teaching Musculoskeletal Clinical Skills: A Best Evidence in Medical Education (BEME) Systematic Review of Techniques and Their Efficacy

Alexandra O' Dunn-Orto, Lisa Hartling, Sandy
Campbell and Anna Oswald

Faculty of Medicine and Dentistry
University of Alberta
Edmonton, Canada

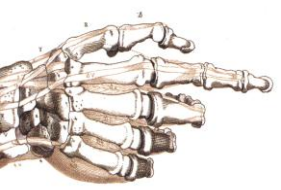




Our Team

- Alexandra O' Dunn-Orto, BA
 - 2nd year medical student, summer studentship
- Lisa Hartling, MSc, PhD
 - Director, Alberta Research Centre for Health Evidence &
 - Director, University of Alberta Evidence-based Practice Center
- Sandy Campbell, BA, MLS, AALIA (CP)
 - Public Services Librarian & library liaison to our Faculty
- Anna E. Oswald, MD, MMed, FRCPC
 - Consultant Rheumatologist
 - MSK Preclinical course coordinator
 - Royal College of Physicians and Surgeons of Canada Clinician Educator

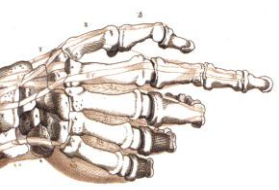




Who Cares? – We do!

- Musculoskeletal (MSK) complaints:
12-20% primary care visits in Canada
- MSK physical examination (PE) skills
weak in practicing physicians
- Shortage of specialist faculty able to
effectively teach this subject

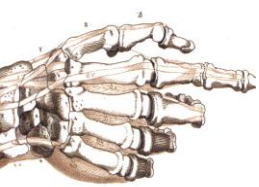




Study Methods

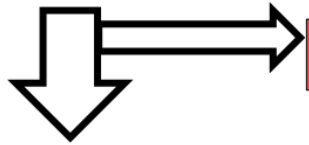
- Key Inclusions:
 - Medical trainees & Drs
 - Structured teaching interventions
 - Controlled comparative studies only
 - Learner attitude, knowledge, skills, behaviour outcomes
 - English language
- Key Exclusions:
 - Learner reaction/Teacher Evals
 - Non structured teaching (e.g. shadowing, mentoring, clinical experience)
 - MSK knowledge or procedural skills without clinical skills teaching
 - Uncontrolled studies (e.g. uncontrolled before-after, prevalence assessments, needs assessments...)





Title and abstract screening:
2 independent reviewers

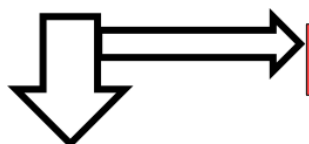
Potentially relevant studies
identified from databases
(n = 5,089) and reference lists
(n = 354)



Excluded abstracts (n =
4,847)

Application of inclusion form
to full texts:
2 independent reviewers

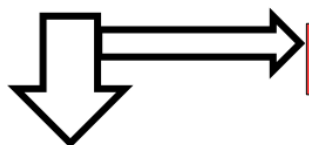
Full text articles obtained from
electronic databases,
reference lists (n = 242) and
grey literature (n = 23)



Excluded studies
(n=239)

Comparison of studies for
multiple publications or
overlapping data:
1 reviewer

Studies relevant to review
question (n = 26)



Excluded studies
(n = 2)

Final number of included
articles (n = 24)



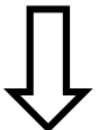
Methodology assessment:
2 independent reviewers

Assessment of
methodological quality



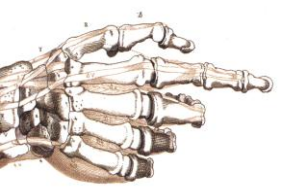
Data extraction

Data extraction:
1 reviewer + cross check
of 20% of articles by a 2nd
reviewer



Data synthesis

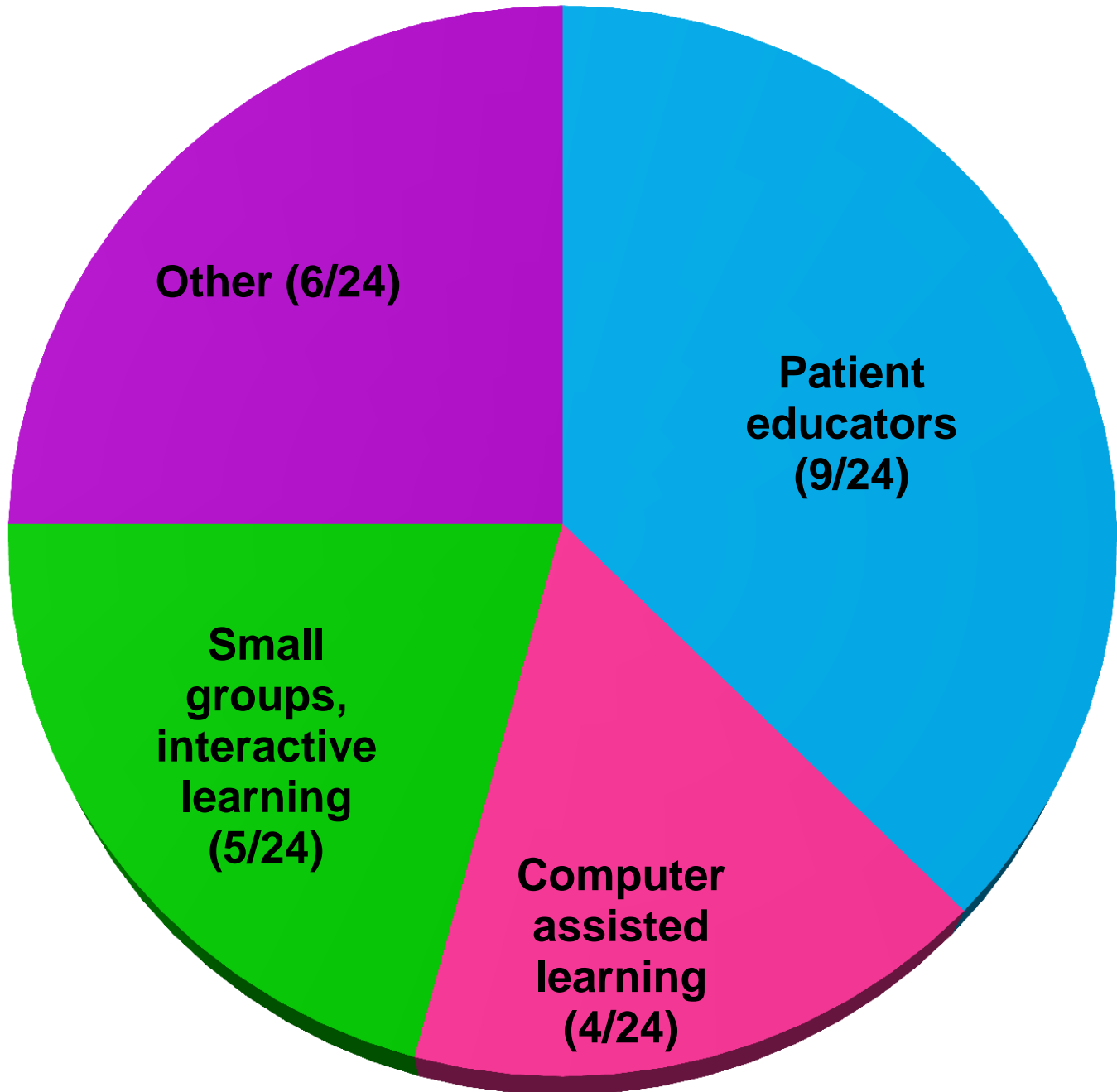
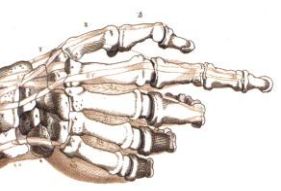


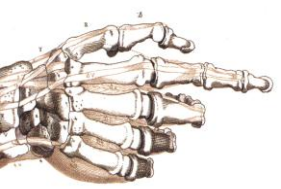


Review Characteristics

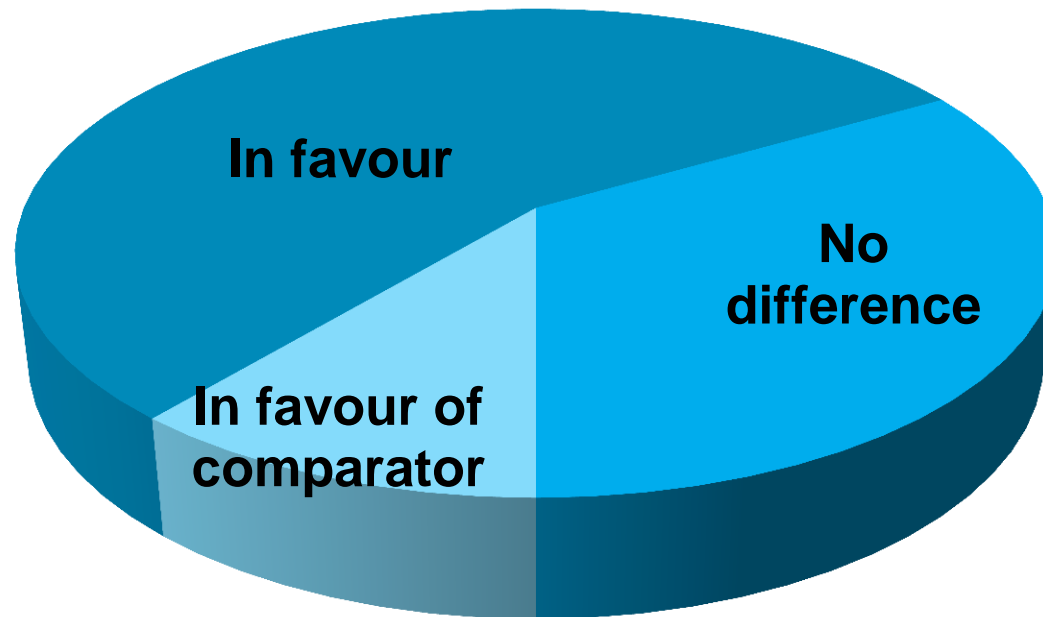
- Total number of participants involved in the trials reviewed > 2500
- 18/24 studied **undergraduate** medical students
 - Remainder studied residents, practicing physicians or a combination of training levels
- 15/24 studies: MSK **OSCEs** as primary outcome
 - Remainder measured knowledge via written test scores or student confidence

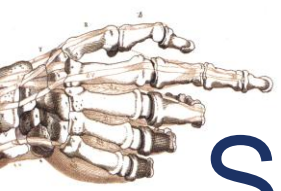




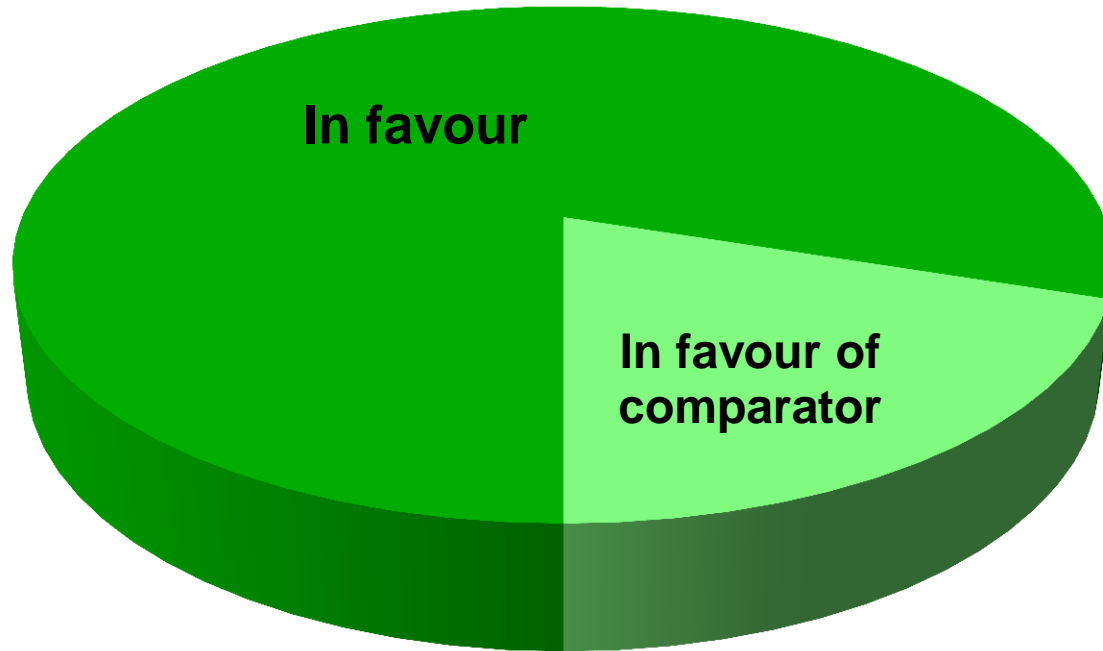


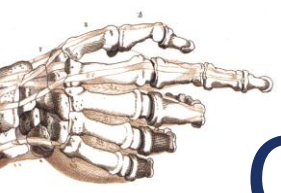
Patient Educator Studies (9/24)



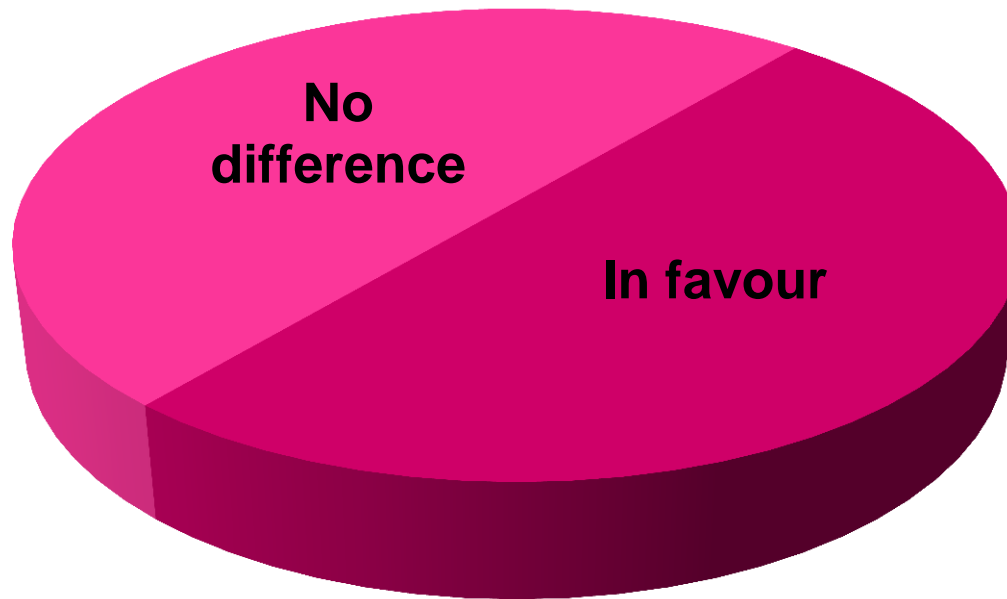


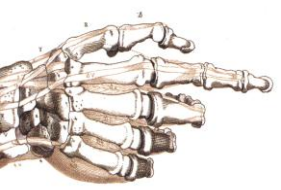
Small group interactive learning (5/24)





Computer assisted learning (4/24)

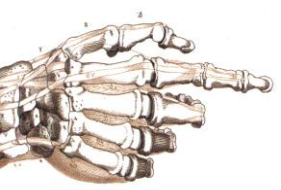




Quality Assessments

Type of study	Number	Common sources of bias
Randomized controlled trials	12	10/12: inadequate blinding
		6/12: incomplete/unclear data presentation
Cohorts	12	9/12: unclear/absent description of blinding
		8/12: incomplete/absent control of participant characteristics

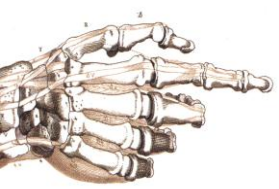
- Only 3/24 studies provided power calculations



Conclusions

- Majority of effective MSK clinical skills teaching interventions **maximize engagement and realistic context**
- Most studies supported **patient educators, interactive small group learning and computer-assisted learning**
- **Alternate instructional methods** may maximize teaching efficiency when instruction time and resources are limited





References

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- Yelin, Edward et al. A national study of medical care expenditures for musculoskeletal conditions: the impact of health insurance and managed care. *Arthritis and rheumatism.* 2001 44 (5):1160-1169.
- Association of American Medical Colleges. Report VII contemporary issues in medicine: musculoskeletal medicine education, Medical school objectives project. 2005 VII:1-13.
- College des Medecins du Quebec Practice Enhancement Division. Clinical practice guidelines: The musculoskeletal system. 1999:1-11.



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Abstracts excluded based on screening criteria (n = 4,847)

Full text articles obtained for potential inclusion from electronic databases and reference lists (n = 242) and grey literature (n = 23)

Studies excluded based on inclusion/exclusion criteria (n = 239)

Studies relevant to review question (n = 26)

Studies excluded due to multiple publications or overlapping data (n = 2)

Final number of included articles (n = 24)