
This study demonstrated that an interactive, multimedia, online, simulation-based educational intervention was more effective and efficient than an interactive, multimedia live presentation in improving primary care physicians’ diagnostic skills.

Using convenience sampling, a control group (27) was selected from individuals attending a live 4-day CME conference and a treatment group (41) selected from individuals previously participating in the author’s web-based CME activities. The topic was the diagnosis of joint pain represented by 7 important causes. Control group received 2 hour multimedia live presentation conducted by expert with demonstration/examples/practice, and feedback via open discussion and questions. Treatment group received 20 minute, multimedia video derived from the live presentation, demonstration/examples, practice and feedback provided by an AI driven diagnostic training simulator/tutor-KBIT (about 20 minutes). Both activities followed principles of Miller (i.e. development of competence a progression of knowledge of facts, knowing how to use facts, applying knowledge) and Merrill (i.e. instructional template of presentation, demonstration, practice, and feedback). Both groups pre- and post-tested using the same 14 test case vignettes, presented in the same order. Pre-intervention diagnostic accuracy 65.1% and 67.1% respectively which is consistent with other studies on diagnostic accuracy. Control group spent 2 hours; treatment group about 50 minutes. Post-training diagnostic accuracy in control group improved 8% (NS); treatment group improved 22% (P<.02)

Problems: Very small control group. Power analysis would have been useful to avoid type 2 error. Control group offered optional, free tutorial on assessment of joint pain at end of the first day of conference. Possibly fatigue a factor in results? Treatment group specifically selected the topic thus perhaps more motivated and also had experience with authors’ web-based CME. Study used complete vignettes with all history, physical exam, laboratory, and radiologic studies, which may not represent actual clinical experience.

The study is useful in that it looks at next level (level 4) of learning (Moore et al): participation, satisfaction, learning, competence (diagnostic accuracy in this case), performance, patient health, community health. Shows that AI-driven simulator/tutor more effective and efficient than live CME in improving diagnostic ability. Study suggests that traditional CME doesn’t improve performance as well for tasks requiring multiple practice opportunities and feedback as basis for developing procedural knowledge.