

COMPARATIVE EFFECTIVENESS OF SIMULATION TRAINING VERSUS OTHER INSTRUCTIONAL METHODS IN VETERINARY EDUCATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objective:

To comprehensively search, critically appraise, and quantitatively synthesize the evidence regarding the effectiveness of simulation training in comparison with other instructional methods used in veterinary education.

Study Design:

Systematic review and meta-analysis

Methods:

A search of major databases (PubMed, Web of Science, CAB Abstracts), key journals, and previous reviews from 1970 through August 2016 was conducted. Extracted information included instructional design, simulation features, control method, learner profiles, quality of studies and outcomes.

Results:

A total of 416 relevant records were identified and screened for inclusion, with 175 full-text articles then assessed for eligibility. Twenty-six independent studies were extracted from 21 reports. The overall weighted mean effect size was moderate for the fixed effects model and moderately strong for the random effects model ($g=0.34$, 0.66 respectively). All clinical outcome measures produced significant ($p<.001$) large mean effect sizes in favor of simulation. Effect for skill outcomes measured by timing ($g=0.89$) and process ($g=0.74$) were homogeneous while those measured by product ($g=0.89$) were highly heterogeneous with a statistically significant Q test ($p<.001$) and corresponding moderately high I^2 (69%).

Conclusions:

This analysis revealed a significant and moderately large effect on learning when students are trained through simulation versus traditional methods. Additional research may elucidate potential moderating variables when clinical skills are measured by product (defined as successful task completion). The results of the current research can help veterinary institutions make informed decisions for academic policy, propel future research and direct funds towards instructional methods that have been shown to increase clinical skills.