

APPENDICES

Appendix I. Quality assessment of studies.

<i>Authors, Year of Publication and Study Title</i>	<i>Recruitment Strategy</i>	<i>Sampling and sample size appropriate?</i>	<i>Ethical approval</i>	<i>Instrument development</i>	<i>Quality measures and significance of findings</i>	<i>Overall quality</i>
<i>Bindoff I., Bereznicki L., Westbury J., Chalmers L., Peterson G., Ollington R. 2014 A Computer Simulation of Community Pharmacy Practice for Educational Use</i>	Volunteer students that met criteria regarding their level of study and year group.	33 participants (16 intervention, 17 control).	The Social Sciences Human Research Ethics Committee at the University of Tasmania.	A detailed description of assessments used.	The VP scenarios were piloted. Discussion of statistical tests: P values and SD presented. Results discussed significance.	High
<i>Douglass M.A., Casale J.P., Skirvi J.A., DiVall V.A. 2013 A Virtual Patient Software Program to Improve Pharmacy Student Learning in a Comprehensive Disease Management Course</i>	Participation occurred automatically as part of a particular pharmacy course.	135 participants took part in various aspects of the study.	Not discussed	Limited information on knowledge questions and survey. Pre- and post-tests were non-identical.	Pre-defined VP definition in the questionnaire to attempt to ensure consistency. Explanation of statistics and P values presented but limited discussion relative to results.	Medium
<i>Fleming M., Olsen D.E., Stathes H., et al. 2009 Virtual Reality Skills Training for Health Care Professionals in Alcohol Screening and Brief Intervention</i>	Recruitment via email and screened via phone. Monetary payment for participation.	102 participants over two groups (n=51 in each). No calculation, states sample too small to assess some statistical changes.	The UW Madison Health Sciences Human Subjects Committee.	Detailed description of the VP, the training of SPs, marking and QA.	Univariate analysis assessed effect of demographics. Mean scores before and after intervention with t-tests and P values.	High
<i>Loke S.K., Tordoff J., Winikoff M., et al. 2011 SimPharm: How pharmacy students made meaning of a clinical case differently in paper- and simulation-based workshops</i>	Not discussed	20 participants. Fourth-year BPharm students.	Not discussed	Discussion of VP. Study used recordings and observation so no instrument.	Considerations for transferability, objectivity, reliability, and triangulation. Analysis not detailed due to qualitative approach.	Low
<i>Shoemaker M.J., De Voest M., Booth A., et al. 2015 A virtual patient educational activity to improve interprofessional competencies: A randomized trial</i>	Not discussed	72 fifth semester pharmacy (n=33), fourth-semester physician assistant (n=27) and fourth-semester physical therapy (n=12) graduate students. No size calculations.	The Human Research Review Committees at Grand Valley State University and Ferris State University.	Description of instrument: mixture of self-designed and RIPLS but no further exploration.	Chi-squared tests, odds ratio, and P values reported. Used the RIPLS within self-designed instruments.	Medium
<i>Taglieri C.A., Crosby S.J., Zimmerman K., Schneider T., Dhiren P.K. 2017</i>	Participation occurred automatically as part of a particular pharmacy course.	Control n=140 Intervention n=5 141. No further comments on sampling.	Not discussed	Order of labs, clinics, and VP use presented. Explanation of	Peer review of study instruments and protocol. Statistical significance considered, results discussed	Medium

<i>Evaluation of the Use of a Virtual Patient on Student Competence and Confidence in Performing Simulated Clinic Visits</i>				assessment and the survey.	relative to significance and P values presented.	
<i>Zary N., Johnson G., Boberg J., et al. 2006</i> <i>Development, implementation and pilot evaluation of a Web-based Virtual Patient Case Simulation environment – Web-SP</i>	Students from the Karolinska institute.	Pharmacy students n=90. Focus on development of software rather than evaluation.	Not discussed	Focus on VP design, evaluation tools not discussed.	No considerations for measuring significance and no explanation of evaluation.	Low
<i>Zlotos L., Power, A., Hill D., Chapman P. 2016</i> <i>A Scenario-Based Virtual Patient Program to Support Substance Misuse Education</i>	Participation was part of a mandatory educational program.	Interviews of 20 trainees (11 control, 9 VP), with 4 trainees having used both case studies.	The NES research governance group considered the study course evaluation. Guidance was sought from the Chief Scientist Office for NHS Scotland.	Explanation of nature of the questionnaire.	Pilot of study instruments. Friedman's test indicated a significant difference between the three assessments. All results significant (P<0.05).	High

Appendix 1. Further evaluation of review studies particularly relating to study quality.