



The Use of Simulated Learning in the Development of Non-Technical Skills in Medical and Allied Health Care Learners

Bates,C., Casiro, N., Chernomaz, K., Klimstra, F., Watson, K. (Supervisor: Redenbach, D. Ph. D)
UBC, Physical Therapy, Vancouver, BC, CAN

Introduction

Simulation training may be helpful for the development of ‘non-technical skills’ (NTS) in health care education. NTS are the cognitive and social skills that complement health care worker’s technical skills¹⁻⁵. Research has shown a need for NTS training in health education, but many areas of medical practice have yet to embrace this training^{6,7}. The rational for including NTS in health care education is based on improving patient safety, meeting medical education core competencies, and gaining the necessary team skills for entry level practice in a medical team environment ¹. In a simulation intervention the learner is required to respond as they would under real-life circumstances.The application of simulation in health care education has traditionally emphasized and continues to focus on the development of technical skill. In this rapidly changing field there is a need for a current and comprehensive review of NTS

Objective

Evaluate evidence for use of simulation in the development of NTS in health care learners (HCL).

Methods

Non-Technical Skills

- Leadership
- Communication
- Situational Awareness
- Interpersonal Skills
- Team Work
- Decision Making
- Stress Management

Participants

- Physicians
- Dentists
- Physical, Occupational, Respiratory Massage Therapists
- Midwives
- Surgeons
- Speech and Language Pathologists
- Chiropractors
- Nurses

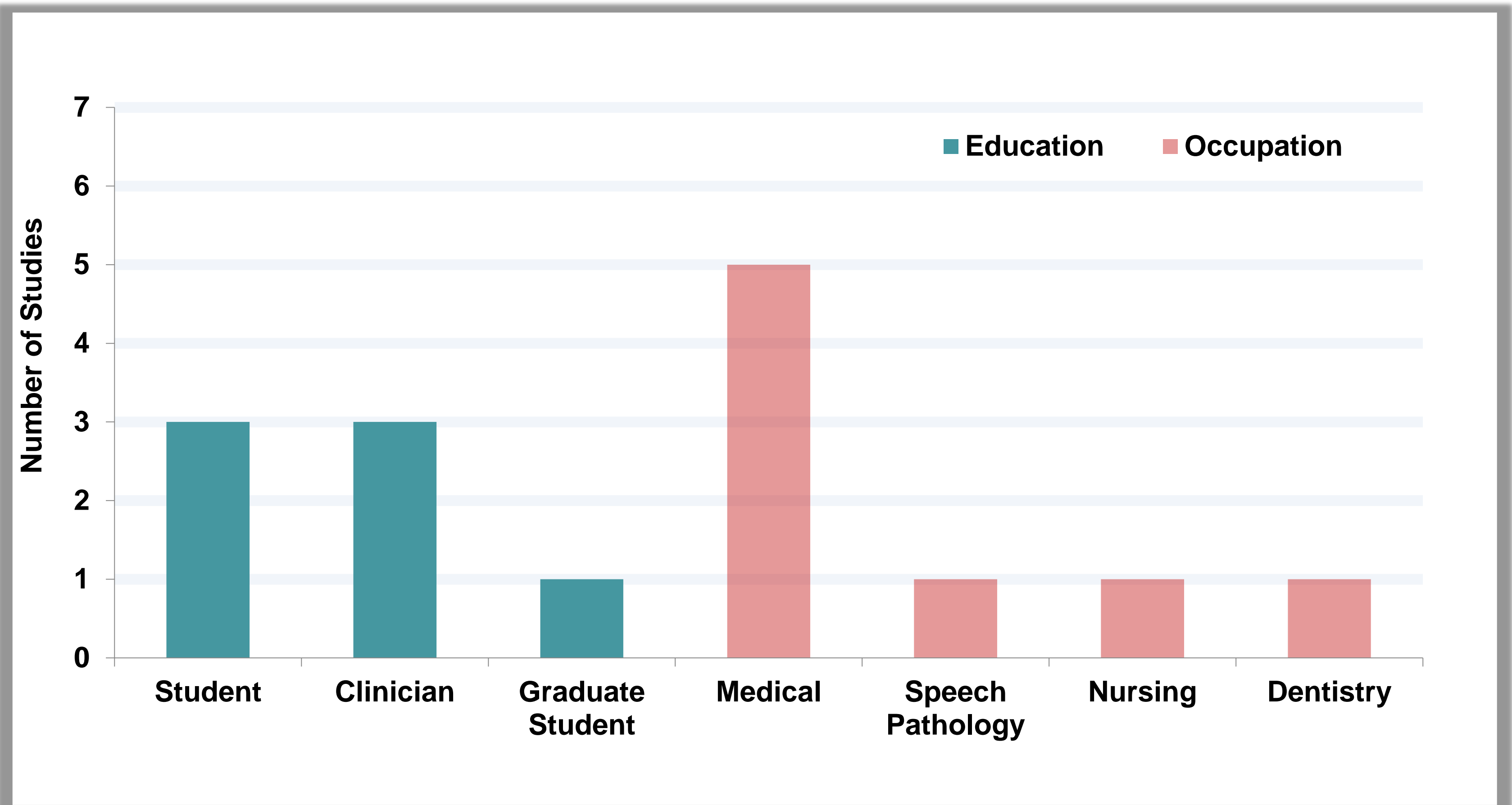
Studies

- Randomized control trials
- Objective measure of ≥ 1 NTS

Intervention

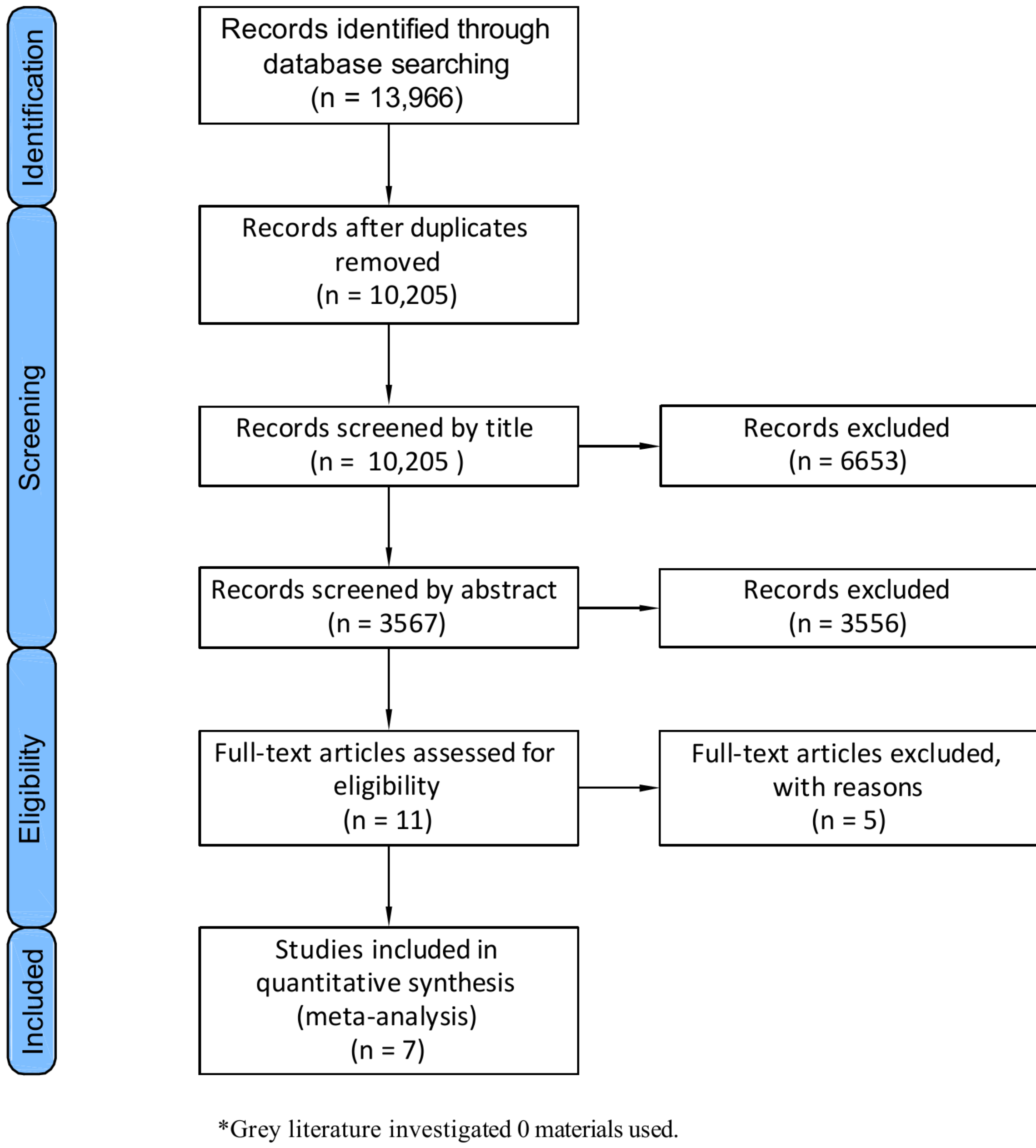
- Simulated learning environments teaching a NTS

Figure 1. Graph of Participants Education Level and Occupation



Search Strategy: Medline, CINAHL, Embase, PubMed, ERIC, PsychINFO, Education Research Complete, Google Scholar, Cochrane and grey literature
Data Collection: Titles were reviewed to select preliminary papers. Abstracts were reviewed; and only those papers meeting all inclusion criteria were reviewed in full and exclusion criteria applied. Studies meeting the inclusion criteria were assessed for methodological quality. This process is shown in Figure 2. Data collection was performed using a piloted data tablet form.

Figure 2. Flow Chart of Study Selection Process



Results

Of the 7 studies included, 5 showed significant changes in the acquisition of NTS, specifically, communication skills (Table 1 and 2).

Table 1. Intervention Duration, Feedback, Improvement and Retention Test for Studies

Study	Intervention Duration	Feedback Provided	Improvement Shown	Retention Test
Helitzer et al. (2011)	1 week	Yes	Yes	Yes (effect sustained)
Janda et al. (2004)	1 week	Yes	Yes	No
Knowles et al. (2001)	5 weeks	Yes	Yes	No
Nikendei et al. (2011)	6 weeks	Yes	Yes	No
Price et al. (2008)	6 weeks	Yes	No	No
Sanci et al. (2002)	6 weeks	Yes	Yes	Yes (effect sustained)
Zraick et al. (2003)	1 day	No	No	No

Table 2. Intervention, NTS and Sample Size for Studies

Study	Intervention	NTS	Sample Size (n/c)
Helitzer et al. (2011)	Standardized Patient Role-Play	Communication skills	26/12
Janda et al. (2004)	Virtual Patient	Professional behavior Empathy	39/16
Knowles et al. (2001)	Standardized Patient	Communication skills	132/40
Nikendei et al. (2011)	Standardized Patient	Communication skills Rapport building Empathy	43/14
Price et al. (2008)	Standardized Patient	Communication skills Rapport building Counseling	121/59
Sanci et al. (2002)	Role-Play	Communication skills Rapport building	139/55
Zraick et al. (2003)	Standardized Patient	Interpersonal Communication skills	18/9

Summary and Conclusion

- 1) There is evidence for the use of simulation in the development of NTS in select medical fields.
- 2) The extent to which simulation is effective and the retention of NTS is undetermined.
- 3) Further high quality research is needed to make more definitive conclusions for NTS gained through simulation-only intervention, NTS retention and NTS transferability to real life encounters.

References

1. Crichton, M. (2001). Training for decision making during emergencies. *Horizons of Psychology*, 10, 7-22.

2. Fletcher, G.C.L., McGeorge, P., Flin, R.H., Glavin, R.J., & Maran, N.J. (2002). The role of non-technical skills in anaesthesia: a review of current literature. *British Journal of Anaesthesia*, 88, 418-429.

3. Laschinger, S.K. (2008). Effect of empowerment on professional practice environments, work satisfaction, and patient care quality: Further testing the nursing worklife model. *Journal of Nursing Care Quality*, 23, 322-330.

4. Bradley, P. (2006). The history of simulation in medical education and possible future directions. *Medical Education*, 40, 254-262.

5. Yee, B., Naik, V.N., Joo, H.S., Savoldelli, G.L., Chung, D.Y., Houston, P.L., Karatzoglou, B.J., & Hamstra, S.J. (2005) Nontechnical Skills in Anesthesia Crisis Management with Repeated Exposure to Simulation-based Education. *Anesthesiology*, 103, 241-248.

6. Palter, V., Grantcharov, T. (2010). Simulation in surgical education. *Canadian Medical Association Journal*, 182, 1191-1196.

7. Pearson, E. & McLafferty, I. (2011). The use of non-technical awareness in final year student nurses. *Nurse Education in Practice*, 11, 399-405.

8. Issenberg et al., (2005). Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. *Med Teach*, 27, 10-28.

9. Sanci, L. A., Day, N. A., Coffey, C. M. M., Patton, G. C., & Bowes, G. (2002). Simulations in evaluation of training: A

medical example using standardised patients. *Evaluation and Program Planning*, 25, 35-46.

10. Price, E. G., Windish, D. M., Magaziner, J., & Cooper, L. A. (2008). Assessing validity of standardized patient ratings of medical students' communication behavior using the roter interaction analysis system. *Patient Education & Counseling*, 70, 3-9.

11. Knowles, C., Kinchington, F., Erwin, J., & Peters, B. (2001). A randomised controlled trial of the effectiveness of combining video role play with traditional methods of delivering undergraduate medical education. *Sexually Transmitted Infections*, 77, 376-380.

12. Janda, M. S., Mattheos, N., Nattestad, A., Wagner, A., Nebel, D., Färbon, C., et al. (2004). Simulation of patient encounters using a virtual patient in periodontology instruction of dental students: Design, usability, and learning effect in history-taking skills. *European Journal of Dental Education*, 8, 111-119.

13. Zraick, R. I., Allen, R. M., & Johnson, S. B. (2003). The use of standardized patients to teach and test interpersonal and communication skills with students in speech-language pathology. *Advances in Health Sciences Education*, 8, 237-248.

14. Helitzer, D.L., Lanoue, M., Wilson, B., de Hernanz, B., Warner, T., & Roter, D. (2011). A randomized controlled trial of communication training with primary care providers to improve patient-centeredness and health risk communication. *Patient Education & Counseling*, 82, 21-29.