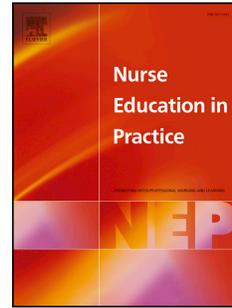


# Accepted Manuscript

Development and psychometric testing of the Satisfaction with Cultural Simulation Experience Scale

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**TITLE: DEVELOPMENT AND PSYCHOMETRIC TESTING OF THE SATISFACTION  
WITH CULTURAL SIMULATION EXPERIENCE SCALE**

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## Development and psychometric testing of the Satisfaction with Cultural Simulation Experience Scale

### Abstract

Decreasing the numbers of adverse health events experienced by people from culturally diverse backgrounds rests, in part, on the ability of education providers to provide quality learning experiences that support nursing students in developing cultural competence, an essential professional attribute. This paper reports on the implementation and evaluation of an immersive 3D cultural empathy simulation.

The Satisfaction with Cultural Simulation Experience Scale used in this study was adapted and validated as the first stage of this study. Exploratory factor analysis and confirmatory factor analysis were undertaken to investigate the psychometric properties of the scale using two randomly-split sub-samples. Cronbach's Alpha was used to examine internal consistency reliability. Descriptive statistics were used for analysis of mean satisfaction scores and qualitative comments to open-ended questions were analysed and coded.

A purposive sample (n= 497) of second of nursing students participated in the study. The overall Cronbach's alpha for the scale was 0.95 and each subscale demonstrated high internal consistency: 0.92; 0.92; 0.72 respectively. The mean satisfaction score was 4.64 (SD 0.51) out of a maximum of 5 indicating a high level of participant satisfaction with the simulation. Three factors emerged from qualitative analysis: "Becoming culturally competent", "Learning from the debrief" and "Reflecting on practice".

The cultural simulation was highly regarded by students. Psychometric testing of the Satisfaction with Cultural Simulation Experience Scale demonstrated that it is a reliable instrument. However, there is room for improvement and further testing in other contexts is therefore recommended.

**Key words:** Cultural simulation, nursing student, cultural competence, satisfaction

# Development and psychometric testing of the Satisfaction with Cultural Simulation Experience Scale

## Introduction

Culturally competent health professionals deliver safe care that is tailored to fit with an individual's or group's cultural values, beliefs and worldviews (Lehman, Fenza, & Hollinger-Smith, n.d). Betancourt et al.( 2003:561) define cultural competence as 'the ability of systems to provide care to patients with diverse values, beliefs and behaviours, including tailoring delivery to meet patients' social, cultural and linguistic needs.' Cultural competence is linked to reduced adverse outcomes (Fernandez, Seligman, Quan, Stern, & Jacobs, 2012) and leads to increases in health-seeking behaviour, more appropriate screening and testing, fewer clinical errors, greater adherence to medical advice, reduced medication errors, and the provision of person-centred care (Lehman et al., n.d).

An immersive three dimensional (3D) simulation experience designed to enhance the cultural competence of nursing students and aid their understanding of the health care experiences of people from culturally and linguistically diverse (CALD) backgrounds is innovative and heralds a way in which to extend the use of simulation. In both undergraduate education and continuing professional development for qualified staff, simulation has become a ubiquitous teaching and learning methodology. However, there is a concomitant need for further research into the use and effectiveness of simulation as it evolves at a rapid rate (Cook et al, 2011). Indeed, the cost imperative of delivering simulation is high and indicates a need to ensure the satisfaction with and impact of such experiences meets the needs of participants and education providers, whilst aligning with intended learning outcomes.

The Satisfaction with Simulation Experience scale (SSES) has proven to be a valid and reliable measure of learners' perceptions of the value of simulation both in nursing and paramedic education (Levett-Jones et al., 2011; Williams & Dousek, 2012). For the current study there was a need to adapt the SSES scale to ensure relevance and applicability to this unique cultural simulation. In this paper we present quantitative and qualitative results in relation to students' satisfaction with the cultural simulation experience and profile the psychometric testing of the Satisfaction with Cultural Simulation Experience Scale (SCSES).

## Background

### *The evolving use of simulation in nursing education*

Simulation is defined as a technique used to amplify real experiences with guided experiences, often immersive in nature, that evoke aspects of the real world (Gaba, 2007); along with the provision of the opportunity for feedback and reflection (Bland et al (2011)). Simulation is generally considered to be an effective and engaging way to augment learning for undergraduate health professional students (Berragan, 2011). Debrief is considered central to the simulation experience with Shinnick et al., (2011) suggesting it may be the *most* important aspect. The debrief is where students 'make sense' of events, and where experiential learning from the simulation can be further explored and deconstructed (Levett-Jones & Lapkin, 2014).

3D simulation has previously been utilised in a range of ways, for example from a personal computer or desktop technology, or in gaming applications (Graham & Richardson 2008). A review paper by Gregory et al. (2013) documents the resurgence of 3D simulation since 2003, across a range of disciplines, and notes that virtual world simulations can equip students to face complex situations in practice, and enable interpersonal skill development for application in practice environments. Although utilised in other disciplines to some extent (Lavin, 2013; Gregory et al. 2013), 3D simulation is not commonly utilised in health professional education and it remains outside of the mainstream use of simulation technology, where a focus on human patient manikins and task trainers is more prevalent (Weaver, 2011).

### ***The need to become culturally competent***

Nursing students come to the university environment with a range of personal and life experiences and undergraduate educational programs are designed to prepare them to provide care for diverse communities, across a range of settings. Cultural competence is considered to be a core competency as evident in professional codes and standards of practice internationally. For example, the Nursing and Midwifery Board of Australia's National Competency Standards for the Registered Nurse (2006) emphasise that registered nurses must 'ensure practice is sensitive and supportive to cultural issues' and 'accept individuals/groups regardless of race, culture, religion, age, gender or sexual preference' (p.5).

Australia is experiencing the effects of globalisation and is amongst the most culturally diverse nations in the world (National Health and Medical Research Council, 2005) where immigration remains a strong influence (Seaton, 2010). The Australian experience is not unique; as Dauvrin and Lorant (2015) note migration is a complex phenomenon, and one that is increasing population diversity across a range of European countries. Compared to general populations, CALD groups experience poorer health, less adequate health care (Butow et al., 2011; Henderson & Kendall, 2011; Horner et al., 2004; (Johnstone, Kanitsaki, & Currie, 2008) and a disproportionate number of adverse health care events (Multicultural Health Communication, 2013). Consideration of cultural competence and health care provision should also include

Australian Indigenous populations where a long history of dispossession, marginalisation and racism has led to health outcomes that are in line with third world countries in terms of mortality and morbidity (Dodson, as cited in Seaton, 2010). Such experiences are replicated in other indigenous groups internationally and are of grave concern (King, Smith & Gracey, 2009). The clinical outcomes for those from diverse CALD backgrounds leaves no doubt that health care providers and undergraduate students must be more effectively prepared to provide culturally competent care for such individuals and families.

Studies have shown that cross-cultural education, informed by various theoretical models, has been effective in improving the cultural knowledge (Allen, Brown, Duff, Nesbitt, & Hepner, 2013), and that culturally competent practice can improve patient outcomes (Betancourt, 2003; Grote, 2008). However, a review of educational approaches and learning outcomes, concluded that strategies designed to develop cultural competence have had a limited impact on discriminatory attitudes (Allen, Brown, Duff, Nesbitt, & Hepner, 2013), and years of research and education in the area of cultural care, have not always translated to behavioural changes in healthcare practice (Grant, Parry, & Guerin, 2013; Grote, 2008).

We argue that engaging nursing students in learning activities that enhance their understanding of and commitment to cultural competence must include a range of strategies to be effective; and as Earley and Peterson (2004, p. 110) advocate, should include motivational, cognitive and metacognitive components. Several studies have highlighted the appropriateness of including simulation as way of enhancing cultural awareness (Roberts et al 2014; Hass, Seckman & Rea, 2010; Roberts, Warda, Garbutt & Curry, 2014). In a study by Graham and Richardson (2008) students were exposed to online games designed to enhance knowledge of cultural roles and the need to respect and accept different ways of interacting. However, the sample size was not providing limiting the ability to draw definitive conclusions about the effectiveness of this approach. In another study Rutledge et al (2008) described a highly integrated simulation where a virtual hospital allowed students (n=340) to interact with culturally diverse individuals and to provide 'hands on' care to a simulated patient (manikin). Giddens et al (2012) also utilised a virtual community approach where 342 first year nursing students from five schools participated. Although there were mixed results about the effectiveness of the virtual community the overall results were encouraging (Giddens, Fogg, & Carlson-Sabelli, 2010; Giddens, Shuster, & Roehrig, 2010).

Although they may exist, no studies were identified where health professional students were exposed to immersive 3D cultural simulations that included a range of sensory stimuli. Thus, it is important to share the results from the current study so that educators and researchers are aware of the utility and effectiveness of such approaches. Additionally, education providers must ensure robust evaluation and examination of simulation experiences. The development of

a stand-alone 3D immersive simulation is unique, and therefore required a rigorous evaluation approach including measurement of student satisfaction and testing of the SCSES.

## **Methods**

### ***Study aim and design***

The results profiled in this paper form one component of a multi-site mixed methods study that aimed to examine the impact of a 3D immersive simulation experience. The purposive sample (n = 497) comprised second year nursing students who participated in the simulation experience as part of their preparation for clinical placement. This paper focuses on students' satisfaction with the simulation experience.

This study utilised a mixed method design with inclusion of quantitative and qualitative data. Development and psychometric testing of the SCSES, adapted from the previously validated SSES (Levett-Jones et al, 2011) is described and qualitative analysis of responses to an open ended question are included.

### **Cultural simulation**

The simulation consisted of a 10 minute video of an unfolding scene in a hospital ward of a developing country. The hospital environment, language, and clinical practices exhibit an amalgamation of cultural behaviours, symbols and metaphors unfamiliar to, and incongruent with, Anglo-Celtic Australian culture. Following introductory briefing students were asked to lie on a bed and view the video through 3D glasses while imagining that they are a patient in the ward. This is a sensory experience with students exposed to a range of unfamiliar sights, sounds, smells and tactile stimuli. The simulation is immediately followed by a debrief and guided reflection.

### **The Satisfaction with Cultural Simulation Experience Scale**

The SCSES was adapted from the SSES (Levett-Jones et al., 2011). It includes 18 items; 9 were common to the SSES (1, 2, 3, 4, 6, 7, 8, 9 and 14) and the remaining 9 items were derived from the literature, modified by the researchers, and reviewed by an expert panel to ensure relevance to the cultural simulation. All items are rated on 5-point Likert scales ("strongly disagree [1]" to "strongly agree [5]"). The SCSES includes items related to culture and values, cultural competence and the simulation debrief. No items are reversed scored. Summed scores for the overall scale range from 18 to 90, with higher scores indicating higher satisfaction with the cultural simulation experience. There is also one open ended question that asks participants to make general comments about their cultural simulation experience.

## Recruitment and ethical considerations

Ethical approval for the study was obtained from the university ethics committee prior to contacting potential participants. Recruitment was via an email sent to nursing students in the target population and an announcement posted on the electronic learning management system (Blackboard™). Although all second year nursing students participated in the simulation experience as part of their preparation for second year clinical placement, only those students who expressed an interest and provided written informed consent were recruited for the study.

## Data collection

Participants were asked to complete the 18 item hard copy SCSES immediately following the simulation experience and debrief.

## Data analysis

### *Quantitative data*

Data analysis was conducted using the Statistical Package for the Social Sciences Statistical Software package version 22.0 for Windows (IBM Corp, Released 2013). Analytic procedures involved three types of analyses: missing value analysis, descriptive analyses, and psychometric analyses. Sample characteristics were described using means, standard deviation and frequencies (percent). Missing data was less than 1% and the series mean method was used to impute the missing responses to the SCSES. A total of 497 cases with complete information were randomized into two samples of size  $n = 100$  (20%) and  $n = 397$  (80%), to conduct the exploratory and confirmatory factor analyses respectively.

The psychometric properties of the SCSES were examined by undertaking several sequential steps and considering various standard statistical criteria. The number of factors to be extracted was determined using the Kaiser criterion (eigenvalues  $>1$ ) and assessment of scree plots. Pearson's correlation coefficients were calculated to investigate the interrelationships between the SCSES factors. The internal consistency of the scale was assessed by using Cronbach alpha coefficient ( $\alpha$ ). Confirmatory factor analysis was then undertaken to assess the fit of the proposed factor structure to the remaining 80% of the dataset. Model fit was examined using a number of fit estimates. A chi-square statistic ( $\chi^2$ ) close to zero; Goodness of Fit index (GFI); CFI (comparative fit index) and TLI (Tucker-Lewis index)  $\geq 0.95$ ; RMSEA (root mean square error of approximation)  $\leq 0.06$ ; and SRMR (standardised root mean square residual)  $\leq 0.05$  are common thresholds of acceptable fit (Brown, 2012; Kline, 2011).

## Results

### *Participant Demographics*

A total of 497 second year nursing students from three campuses participated in the study. The majority of the sample (88.1%) was female. Their ages ranged from 18 to 60 years, with an average age of the 27.4 years (SD = 8.6). Eighty-four percent of participants were born in Australia; 5.8% in Asia; 3.6% in Africa; and 6% in other countries. Three percent of the sample identified as being of Aboriginal or Torres Strait Islander descent. Eighty-six percent of the participants spoke English only while 13% spoke another language in addition to English. The demographic characteristics of the sample are shown in Table 1.

Insert about here: **Table 1: Demographic characteristics of the participants (n=497)**

### ***Psychometric testing of the SCSES***

#### ***Exploratory factor analysis***

Initially, the adequacy of the first random sample (n = 100, 20%) for undertaking factor analysis on the 18 SCSES items was examined using several well-recognised criteria. Firstly, all 18 items correlated at least 0.30 with at least one other item, suggesting reasonable factorability. Secondly, the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.84, above the recommended value of 0.60 (Hill, 2011); and Bartlett's test of sphericity was significant ( $\chi^2 = 1284.94$ ,  $df = 153$ ,  $p < 0.001$ ). The diagonals of the anti-image correlation matrix were all over 0.50 and communalities were all above 0.30 supporting the inclusion of each item in the factor analysis (Pett, Lackey, & Sullivan, 2003). Given that each of these indicators was adequately met the sample size was considered adequate for factor analysis.

Principle Components Analysis (PCA) with orthogonal rotation (varimax) was conducted to identify the factors underlying the SCSES. A three-factor solution with eigenvalues above 1 was obtained, explaining 65.93% of the variance obtained. The initial eigen values showed that the first factor explained 27.45% of the variance, the second factor 25.30% of the variance, and a third factor 13.14% of the variance (Table 2). The screen plot exhibited a departure from linearity that justified retaining a three factor structure. All items had primary loadings over 0.40 and the three subscales identified were descriptively labelled:

1. ***Subscale 1: Becoming culturally competent.*** Seven items (11-17) with loadings ranging from 0.57 to 0.86 loaded on factor one. The top item within factor one was item 16: "I believe the simulation will help me to be more empathetic when I care for culturally and linguistically diverse patients"
2. ***Subscale 2: Learning from the debrief.*** Eight items (1, 2, 4, 5, 6, 7, 8, and 9) with loadings ranging from 0.51 to 0.88 loaded on factor two. The top item within factor two was item 1: "The facilitator provided constructive feedback during the debrief"

3. **Subscale 3: Reflecting on practice:** Three items (3, 10, and 18) with loadings ranging from 0.50 to 0.78 loaded on factor three. The top item within factor two was item 18: “The simulation helped me to recognise my strengths and weaknesses in terms of cultural competence.”

Insert about here: **Table 2: Summary of exploratory factor analysis results for the Satisfaction with Cultural Simulation Experience Scale**

An examination of the inter-relationships between the three factors was undertaken using Pearson’s correlation. There was a moderate positive correlation between factors 1 and 2 ( $r = 0.619, p < 0.01$ ); factors 1 and 3 ( $r = 0.559, p < 0.01$ ); and between factors 2 and 3 ( $r = 0.486, p < 0.01$ ). These results indicate moderate association between factors.

**Internal consistency reliability**

An internal consistency analysis was performed on the 18-item two-component SCSES using Cronbach’s alpha on the 20 percent random sample ( $n = 100$ ). The alphas were 0.92 for factor 1, 0.88 for factor 2, 0.70 for factor 3 and 0.92 for the overall scale, suggesting high internal consistency. No substantial increases in alpha for any of the scales would have been achieved by deleting any items and therefore all 18 items were retained for further analysis.

**Confirmatory factor analysis**

The three-factor model was tested to evaluate the data from the 18 items using a maximum likelihood confirmatory factor analysis (CFA) and the 80% sample ( $n = 397$ ) that was retained for this purpose. All 18 items loaded significantly on their respective factors: *Becoming culturally competent*; *Learning from the debrief*; and *Reflecting on practice*. The chi-square statistic value for the overall model was  $\chi^2 (660.217) = 127 (p < 0.001)$ . Although the chi-square statistic suggested a lack of fit, this statistic has been shown to be influenced by large sample size leading to errors (Kline, 2011). The other model estimates GFI = 0.85, CFI = 0.91, TLI = 0.89, RMSEA (90% confidence interval [CI] = 0.10 (0.095, 0.111), and SRMSR = 0.0719 did not meet the criteria for acceptable fit. These model estimates suggested that there was additional room for improvement. Subsequently, a systematic iterative process that allowed items to double load on multiple factors and removal of other items was conducted in an attempt to improve model fit. However, re-examination of a range of estimates for the alternative models, including the indexes of the goodness of fit, statistical significance testing of factor loadings, correlations among factors, and the computation of confidence intervals for the model, did not result in improved model fit.

**Descriptive statistics of the SCSES subscales**

The item analysis on the SCSES indicated that the responses were skewed to the left, with most participants responding either “Agree” or “Strongly Agree” on all items.

### ***Reliability analysis***

A Cronbach’s alpha coefficient was calculated for each of the subscales of the SCSES using the entire sample to determine internal consistency of the measure. The results showed a Cronbach’s alpha of 0.92 for Factor 1, 0.92 for Factor 2 and 0.72 for Factor 3. The overall Cronbach’s alpha for the scale was 0.95. This indicates that the SCSES had high internal consistency given that internal consistency values of greater than 0.70 are recommended ( DeVellis, 2011).

### **Qualitative findings**

The free text comments add further depth to understanding the experience of the participants. Data analysis began with reading all data repeatedly to achieve immersion and obtain a sense of the whole. Open coding was used and each word and sentence were given a conceptual label which characterised the idea and/or its meaning (Strauss & Corbin, 1998). During the coding process data were closely examined by the researchers, the exact words from the text that appeared to capture key thoughts were highlighted and a detailed interpretation undertaken to discover underlying meanings (Morse & Field, 1995). Segments of the data that were deemed to be relevant were then moved in the coding table (see Table 4) (Strauss & Corbin, 1998) along with examples of recurring comments.

Seventy one participants responded to the open ended question. Their comments highlight that they highly valued the simulation experience. Many noted that the experience ‘opened their eyes’ to the experience of CALD populations, with some describing a profound shift in understanding and application of learning to life and practice experiences. They described it as effective, invaluable, realistic, beneficial, motivating, the best simulation we have had, perhaps somewhat influenced by the fact that this was a novel experience and the first time each had been exposed to this type of cultural simulation.

## **Discussion**

This paper has profiled the psychometric testing of the Cultural Simulation Experience Scale (SCSES). This scale was adapted from the SSES which has been previously reported to show consistent reliability with nursing and paramedic students (Williams & Dousek 2012; Levett-Jones et al. 2011) when used to measure satisfaction in relation to human patient simulation manikin-based experiences. The current study was the first time that the cultural simulation was implemented and the SCSES used. Although some educational strategies designed to teach

cultural competence have been implemented in Australia and internationally, simulations that expose learners to an immersive 3D simulation with a range of sensory stimuli have not been reported. Additionally, there are few rigorous instruments for evaluating student satisfaction with cultural simulation experiences.

Measurement of user satisfaction is one of the most important methods of evaluating the implementation of educational initiatives. Sun et al (2008) suggest that it is important to determine whether or not learners will engage with a new teaching approaches and to identify factors that encourage or discourage engagement. Pike (1991) suggests that satisfaction exerts a greater influence on learning than learning exerts on satisfaction and that student satisfaction helps to build self-confidence which in turn enhances skill development. While, it is important that educational initiatives such as this cultural simulation are appropriately evaluated for their capacity to create satisfying and engaging learning experiences, most studies exploring this domain do not use rigorous research designs. The SCSES was found to be a reliable instrument for measuring satisfaction in relation to a cultural simulation experience in a population of second year nursing students and the high mean SCSES scores ( $4.64 \pm 0.51$  out of 5) attest to capacity of the cultural simulation to generate positive student responses to the learning experience. The findings from the content analysis illuminate some of the reasons underpinning these high student satisfaction scores. It is evident from the participants' responses that many valued the cultural simulation and found it to be an authentic, engaging and thought provoking learning experience. Participant comments also indicated that the simulation challenged them to reflect upon their previously held values and beliefs in regards to cultural competence and to consider these from a new perspective.

The psychometric testing of the SCSES was conducted using a two-step process. This is more feasible than a study replication in that the two-step process enables researchers to run CFA independently on both samples to compare and confirm the results (Lomax & Schumacker, 2012). The Cronbach's alpha coefficient ( $\alpha$ ) values for the overall SCSES and each of the subscales indicated high internal consistency. Cronbach's alpha can range from 0 to 1, with higher values indicating greater interrelatedness between items. According to the literature, values ranging from 0.70 to 0.95 are considered more adequate for this parameter (Nunnally & Bernstein, 1994; Bland, 1997), however, values as low as 0.70 can still indicate a reliable scale for psychological constructs (Kline, 1999) or for exploratory research.

Although it is most commonly reported index of internal consistency,  $\alpha$ , like most statistical analyses does have some weaknesses (Cho & Kim, 2014). Cronbach's alpha reflects the degree to which items on the scale are interrelated but do not necessarily indicate unidimensionality or internal consistency of the construct or measure (Schmitt, 1996). Therefore

the high  $\alpha$  value of 0.92 for the overall SCSES may suggest that the items measure highly related constructs, but not necessarily a single construct (Streiner, 2003). It is however acknowledged that the high value obtained was specific to the purposive sample of second year nursing students and should be recalculated with additional samples in future studies.

Results from the PCA suggested a three-factor solution that explained 65.93% of the variance; this meets the minimum accepted 50% for healthcare psychometrics (Pett et al., 2003). Further appraisal using maximum likelihood CFA could not yield acceptable model estimates values required for acceptable fit. An attempt to consider a number of alternative models did not result in improved model fit and was therefore not informative in providing evidence for the factor structure using this sample of second year nursing students. Instrument development is an iterative process and further testing in different contexts and with diverse cohorts is therefore needed to provide additional evidence of psychometric integrity.

### ***Limitations***

The response rate for the SCSES was good however it is acknowledged that this does not necessarily protect against bias. As with any survey, there is a possibility that participants may differ in character or attitudes from non-participants. It should also be noted that, although fairly typical of the student cohorts from which they were drawn, the survey participants cannot be assumed to be necessarily representative of a larger population outside the study context. An additional limitation of the SCSES is that responses were based on self-report. Responses obtained in this manner may be subject to social desirability that may bias answers towards more acceptable norms.

### **Conclusion**

This paper has demonstrated that students highly valued the cultural simulation experience and recognised its relevance to their learning and clinical practice. Psychometric testing indicated that the SCSES is a reliable instrument. However, instrument development is an iterative process and further use of the SCSES in different contexts and with diverse cohorts will provide additional evidence of psychometric integrity. It should be noted that while satisfaction is a useful and important measure of student engagement, a limited number of studies have shown a direct correlation between students' report of satisfaction with simulations and other outcome measures and this warrants further investigation. Specifically, the value of the cultural simulation should be further investigated to determine its impact on knowledge, confidence and attitudes, as well as transferability to practice and ultimately patient outcomes (Kirkpatrick, 1994).

## References

- Allen, J., Brown, L., Duff, C., Nesbitt, P., & Hepner, A. (2013). Development and evaluation of a teaching and learning approach in cross-cultural care and antidiscrimination in university nursing students. *Nurse Education Today*, 33(12), 1592-1598. doi: 10.1016/j.nedt.2012.12.006
- Australian Nursing and Midwifery Council. (2006). *National Competency Standards for the Registered Nurse [electronic Resource]*. Melbourne VIC: Australian Nursing and Midwifery Council.
- Bland, J. M., & Altman, D. G. (1997). Statistics notes: Cronbach's alpha. *BMJ: British Medical Journal*, 314(7080), 572.
- Brown, T. A. (2012). *Confirmatory factor analysis for applied research*: Guilford Press.
- Cho, E., & Kim, S. (2014). Cronbach's Coefficient Alpha Well Known but Poorly Understood. *Organizational Research Methods*.
- Dauvrin, M. & Lorant, V. (2015). Leadership and cultural competence of healthcare professionals. *Nursing Research*, 64(3), 200-210.
- DeVellis, R. F. (2011). *Scale development: Theory and applications* (Vol. 26): Sage Publications.
- Fernandez, A., Seligman, H., Quan, J., Stern, R. J., & Jacobs, E. A. (2012). Associations between aspects of culturally competent care and clinical outcomes among patients with diabetes. *Medical Care*, 50(9 (Suppl 2)), S74-S79.
- Gaba, D. (2007). The future vision of simulation in healthcare. *Simulation in Healthcare*, 2(2), 126 - 135.
- Giddens, J., Fogg, L., & Carlson-Sabelli, L. (2010). Learning and engagement with a virtual community by undergraduate nursing students. *Nursing Outlook*, 58(5), 261-267.
- Giddens, J. F., Shuster, G., & Roehrig, N. (2010). Early student outcomes associated with a virtual community for learning. *The Journal of nursing education*, 49(6), 355-358. doi: 10.3928/01484834-20100217-03
- Hill, B. D. (2011). *The sequential Kaiser-Meyer-Olkin procedure as an alternative for determining the number of factors in Common Factor Analysis: a Monte Carlo simulation*. Oklahoma State University.
- IBM Corp. (Released 2013). IBM SPSS Statistics for Windows, Version 22.0. Retrieved from
- Johnstone, M.-J., Kanitsaki, O., & Currie, T. (2008). The nature and implications of support in graduate nurse transition programs: An Australian study. *Journal of Professional Nursing*, 24(1), 46-53.
- Kline, P. (1999). *The handbook of psychological testing* (2nd ed.). London: Routledge.

- Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York: Guilford Press.
- Lehman, D., Fenza, P., & Hollinger-Smith, L. (n.d). Diversity & Cultural Competency in Health Care Settings. from <http://www.matherlifewaysinstituteonaging.com/wp-content/uploads/2012/03/Diversity-and-Cultural-Competency-in-Health-Care-Settings.pdf>
- Levett-Jones, T., & Lapkin, S. (2014). A systematic review of the effectiveness of simulation debriefing in health professional education. *Nurse Education Today*, 34(6), e58-e63. doi: 10.1016/j.nedt.2013.09.020
- Levett-Jones, T., McCoy, M., Lapkin, S., Noble, D., Hoffman, K., Dempsey, J., . . . Roche, J. (2011). The development and psychometric testing of the Satisfaction with Simulation Experience Scale. *Nurse Education Today*, 31(7), 705-710. doi: 10.1016/j.nedt.2011.01.004
- Lomax, R. G., & Schumacker, R. E. (2012). *A beginner's guide to structural equation modeling*. Routledge Academic.
- Multicultural Health Communication. (2013). Fast facts on language culture and patient safety. Retrieved September 10th, 2014, from [http://www.multiculturalhealthweek.com/uploads/Fastfacts\\_on\\_language\\_culture\\_and\\_patient%20safety.pdf](http://www.multiculturalhealthweek.com/uploads/Fastfacts_on_language_culture_and_patient%20safety.pdf)
- National Health and Medical Research Council. (2005). Cultural competency in health: A guide for policy, partnerships and participation. Retrieved 10 September 2014, from <http://www.nhmrc.gov.au/guidelines/publications/hp19-hp26>
- Nunnally J, Bernstein L. (1994). *Psychometric theory*. New York: McGraw-Hill Higher, INC
- Pett, M. A., Lackey, N. R., & Sullivan, J. J. (2003). *Making sense of factor analysis: The use of factor analysis for instrument development in health care research*. Sage.
- Pike, G. (1991). The effects of background, coursework, and involvement on students' grades and satisfaction. *Research in Higher Education*, 32(1), 15-31.
- Roberts, S.J., Warda, M., Garbutt, S. & Curry, K. (2014). The use of high fidelity simulation to teach cultural competence in the nursing curriculum. *The journal of Professional Nursing*, 30,(3) 259-265.
- Seaton, P. L. (2010). *Cultural care in nursing: a critical analysis*. (PhD Thesis), University of Technology, Sydney. Retrieved from <http://epress.lib.uts.edu.au/research/bitstream/handle/10453/20316/02Whole.pdf?sequence=4>
- Shinnick, M., Woo, M., Horwich, T., & Steadman, R. (2011). Debriefing: The most important component in simulation? *Clinical Simulation in Nursing*, 7(3), e105-e111. doi: 10.1016/j.ecns.2010.11.005

- Streiner, D. L. (2003). Being inconsistent about consistency: When coefficient alpha does and doesn't matter. *Journal of personality assessment*, 80(3), 217-222.
- Sun, P.C., Tsai, R. J., Finger, G., Chen, Y.Y., & Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education*, 50(4), 1183-1202.
- Williams, B., & Dousek, S. (2012). The satisfaction with simulation experience scale (SSES): A Validation Study. *Journal of Nursing Education and Practice*, 2(3), 74-80. doi: 10.5430/jnep.v2n3p74

**Table 1: Demographic characteristics of the participants (n=497)**

<b>Demographic characteristic</b>	<b>Frequency</b>	<b>Percent %</b>
<b>Location</b>		
Campus 1	298	60
Campus 2	121	24.3
Campus 3	78	15.7
<b>Gender</b>		
Female	438	88.1
Male	59	11.9
<b>Country of Birth</b>		
Australia	419	84.3
China	8	1.6
Philippines	8	1.6
Zimbabwe	8	1.6
South Korea	6	1.2
Nigeria	5	1.0
UK	5	1.0
New Zealand	3	0.6
Other	35	7.1
<b>Qualification</b>		
HSC	202	40.6
Diploma/Advanced Diploma	61	12.3
Year 10/11/Ordinary level	50	10.1
Cert IV/ Tafe/ Cert Iv Aged Care	45	9.1
Open Foundation/New Step/ Uni Path	35	7.0
Certificate III	42	8.5
Year 8 or Other	32	6.4
Bachelor's Degree	30	6.0
<b>Employment</b>		
Not Employed	236	47.5
Assistant in Nursing (AIN)	175	35.2
Other Health care e.g Pharmacy Assistant, Pathology Collector	47	9.5
Endorsed Enrolled Nurse / Enrolled Nurse	19	3.8
Other/ Not stated	20	4.0

**Table 2: Summary of exploratory factor analysis results for the Satisfaction with Cultural Simulation Experience Scale**

Cultural Simulation Experience Scale (N= 496)	Component		
	1	2	
Q1: The facilitator provided constructive feedback during the debrief		0.88	
Q2: The facilitator summarised important issues during the debrief		0.77	
Q3: I had the opportunity to reflect on the cultural simulation experience during the debrief			0.50
Q4: The debrief provided an opportunity to ask questions		0.51	
Q5: I believe the debrief has helped me be more understanding of the needs of culturally and linguistically diverse patients		0.67	
Q6: Reflecting on and discussing the cultural simulation during the debrief enhanced my learning		0.77	
Q7: The facilitator's questions helped me to learn		0.65	
Q8: I received feedback during the debrief that helped me to learn about caring for culturally and linguistically diverse patients		0.66	
Q9: The facilitator made me feel comfortable and at ease during the debrief		0.65	
Q10: The simulation caused me to reflect upon my own culture and values			0.65
Q11: As a result of the cultural simulation I have more empathy towards culturally and linguistically diverse patients	0.73		
Q12: I believe the simulation has enabled me to be more culturally competent in clinical practice	0.76		
Q13: The simulation helped me to recognise the importance of undertaking a cultural assessment	0.79		
Q14: This was a valuable learning experience	0.79		
Q15: The simulation developed my understanding of the relationship between cultural competence and patient safety	0.57		
Q16: I believe the simulation will help me to be more empathetic when I care for culturally and linguistically diverse patients	0.86		
Q17: I will be able to apply what I have learned from the cultural simulation to my clinical practice	0.72		
Q18: The simulation helped me to recognise my strengths and weaknesses in terms of cultural competence			0.78
Eigenvalues	8.63	1.95	1.29
Explained Variance	27.49	25.30	13.14
Cronbach's alpha ( $\alpha$ )	0.92	0.88	0.70

**Table 3: Qualitative comments with exemplars**

<b>Theme</b>	<b>Exemplar (participant quote)</b>
Sound learning experience	I learnt a lot and believe that due to this simulation I will be able to communicate well with a culturally diverse patient in the future
Open my eyes	The simulation really opened my eyes to what it's like being a patient in a different country. I will definitely be aware of this in my nursing practice.
Profound learning	It was an invaluable experience. I took a lot away from this and faced some realisations about my own culture and (I'm ashamed to say) cultural ignorance. I consider myself an empathetic person but this experience will stay with me.
Application of knowledge and understanding in practice	The simulation was a very effective exercise and I feel a lot more confident in my ability to communicate with culturally and linguistically diverse patients. I have also learnt the utter importance of compassion and non-verbal communication
Debriefing	It was a very good learning experience. Especially when being facilitated by a good, well-versed instructor during debrief
Realness of simulation (fidelity)	This simulation was very beneficial. It put you in a very realistic environment and made you feel like the patient. The visual and auditory stimuli and the smells made it more realistic and made me feel like I was in a real situation.
Comparison and reflection on prior simulation	I thought this was the best simulation we have had yet. I experienced emotions that reflected my immersion in the situation as a real patient. This was reflected in my increased blood pressure during the simulation.

## Highlights:

- Creating engaging simulations to support development of cultural competence is critical to patient safety.
- Satisfaction with the immersive 3D simulation experience was high
- Three factors emerged from analysis: “Becoming culturally competent”, “Learning from the debrief” and “Reflecting on practice”.
- The Satisfaction with Cultural Simulation Experience Scale is a reliable instrument