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Teaching and Learning Interventions Designed to Improve Cultural Competence in Health Profession Students: A Systematic Review

Gloria Nkhoma
Royal Melbourne Institute of Technology, gloriaknkhoma@hotmail.co.uk

Chiao Xin Lim
Royal Melbourne Institute of Technology, chiao.xin.lim@rmit.edu.au

Gerard A. Kennedy
Federation University, g.kennedy@federation.edu.au

Ieva Stupans
Royal Melbourne Institute of Technology, ieva.stupans@rmit.edu.au

Teaching and Learning Interventions Designed to Improve Cultural Competence in Health Profession Students: A Systematic Review

Abstract

Purpose: Developing healthcare profession students' cultural competency knowledge, skills and attributes is critical to meet the needs of culturally and linguistically diverse healthcare service consumers. The purpose of this systematic review was to identify effective cultural competence interventions for healthcare profession students. Methods: A systematic review of peer reviewed articles published from 2010-2021 using PRISMA guidelines was conducted by searching CINAHL, EMBASE, ERIC, PubMed, and Psych INFO databases. Article quality was assessed using the Evaluation Tool for Quantitative Research and Mixed Method Appraisal Tool. Results: The initial search identified 2,261 potentially relevant studies, 41 studies met the inclusion criteria in which intervention effectiveness was evaluated using a validated outcome measure pre- and post- intervention. Only one study used a non-self-report outcome measure. Out of the 41 studies, only eight studies employed randomisation in the method. Conclusion/ Recommendations: This review evaluated effectiveness of cultural competence interventions and evaluation of the intervention using either self-report or non-self-report validated outcome measures at pre- and post-intervention exposure. Combining cultural competence teaching methods such as lectures with simulations, role-playing and community engagement with diverse populations enhanced cultural competence. Further studies are required to compare effective cultural competence teaching models and identify reliable non-self-report outcome measures to assess the effectiveness of interventions post-exposure. Comparing effective cultural competence teaching models that utilise reliable non-self-report outcome measures will be valuable for guiding the design of teaching and learning interventions directed towards cultural competence. Further research is also required to examine the duration of intervention efficacy and how to maintain efficacy post-intervention exposure. Findings from this review are important for designing and structuring of cultural competence curriculum for healthcare profession students and informing future research on cultural competence teaching. This review has identified that most evaluation tools and studies have been designed for the nursing discipline. There is need to design more cultural competence evaluation tools and studies for other healthcare disciplines such as pharmacy and physical therapy.

Author Bio(s)

Gloria Nkhoma is a PhD student in the school of health and biomedical sciences and has interest in addressing health inequalities in asylum seekers, refugees and culturally diverse populations. The main focus of my thesis is on identifying and addressing an essential element for healthcare services for asylum seekers.

Ieva Stupans, PhD, is a Professor in pharmacy, an experienced pharmacy academic who has wide research interests. In her teaching she strives to develop learning opportunities and assessment tasks that are learner focused.

Gerard A. Kennedy, PhD, is a professor in clinical psychology, has developed his expertise in sleep psychology during more than 24 years of practice as a senior clinical psychologist in the Department of Respiratory and Sleep Medicine at Austin Hospital Health. He maintains a strong research program in the area of sleep and circadian rhythms, and other areas of psychology. He has published more than 200 articles in refereed journals and books, and given many conference presentations, presentations to the media and community organisations.

Chiao Xin Lim, PhD, is a registered pharmacist with experience in community and hospital pharmacy. She has been working in academia since 2013, and currently coordinates 3rd year undergraduate pharmacy

practice courses at Royal Melbourne Institute Technology. Her research interests are focused on personalised medicine and improving health outcomes of culturally and linguistically diverse populations.

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Gloria Nkhoma[1]
Chiao Xin Lim[1]
Gerard A. Kennedy[2]
Ieva Stupans[1]

1. Royal Melbourne Institute of Technology
2. Federation University

Australia

ABSTRACT

Purpose: Developing healthcare profession students' cultural competency knowledge, skills and attributes is critical to meet the needs of culturally and linguistically diverse healthcare service consumers. The purpose of this systematic review was to identify effective cultural competence interventions for healthcare profession students. **Methods:** A systematic review of peer reviewed articles published from 2010-2021 using PRISMA guidelines was conducted by searching CINAHL, EMBASE, ERIC, PubMed, and Psych INFO databases. Article quality was assessed using the Evaluation Tool for Quantitative Research and Mixed Method Appraisal Tool. **Results:** The initial search identified 2,261 potentially relevant studies, 41 studies met the inclusion criteria in which intervention effectiveness was evaluated using a validated outcome measure pre- and post- intervention. Only one study used a non-self-report outcome measure. Out of the 41 studies, only eight studies employed randomisation in the method. **Conclusion/Recommendations:** This review evaluated effectiveness of cultural competence interventions and evaluation of the intervention using either self-report or non-self-report validated outcome measures at pre- and post-intervention exposure. Combining cultural competence teaching methods such as lectures with simulations, role-playing and community engagement with diverse populations enhanced cultural competence. Further studies are required to compare effective cultural competence teaching models and identify reliable non-self-report outcome measures to assess the effectiveness of interventions post-exposure. Comparing effective cultural competence teaching models that utilise reliable non-self-report outcome measures will be valuable for guiding the design of teaching and learning interventions directed towards cultural competence. Further research is also required to examine the duration of intervention efficacy and how to maintain efficacy post-intervention exposure. Findings from this review are important for designing and structuring of cultural competence curriculum for healthcare profession students and informing future research on cultural competence teaching. This review has identified that most evaluation tools and studies have been designed for the nursing discipline. There is need to design more cultural competence evaluation tools and studies for other healthcare disciplines such as pharmacy and physical therapy.

Keywords: cultural competence, health profession students, validated outcome measures, interventions, transcultural self-efficacy

INTRODUCTION

The populations of many countries now include a significant proportion of people from diverse cultural and linguistically diverse (CALD) backgrounds.[1] To work effectively with diverse populations, health professionals need to have acquired cultural competence and work continuously to improve on it.[2] Accordingly, it is critical to address cultural competence in the teaching and learning programs of health professional students. It has been noted that to practice effectively, healthcare providers need to be aware of the cultural, lifestyle and spiritual diversity of their clients.[3,4] Culturally competent health professionals have the capability to provide effective and quality healthcare to culturally and linguistically diverse groups, which can assist in reducing health inequities.[5,6]

Cultural competence necessitates attainment of a set of congruent behaviours and attitudes that enable one to effectively work in cross cultural situations.[7] The cultural competence notion has commanded significant attention, and there are several definitions and conceptualisations.[8,9.] The term "cultural competence" has several interpretations and definitions dependent on the context in which it is used. This is in part due to it being viewed from either an essentialist perspective which entails a static and unchanging state, or constructivist perspective which is dynamic.[10,11]

Other terms such as cultural humility, safety, and responsiveness have been associated or used interchangeably with cultural competence.[12,13] Cultural competence has been criticised as not being holistic by some authors, as it has been identified to be lacking aspects of cultural humility-focusing on self-reflection and personal critique.[14] However, some critics have suggested cultural humility complements and has a synergistic relationship with cultural competence, where humility permeates into cultural competence domains such as cultural encounters and skills.[8,9,15] Cultural humility does not replace cultural competence, and thus the relevance of cultural competence is established as a standalone concept in this review.[8,9,15]

There are several conceptual models of cultural competence for example the one proposed by Campinha-Bacote,[16] identified as the main cornerstone of cultural competence in healthcare comprised of 5 constructs: (1) Awareness- the process of conducting a self-examination of own's prejudices and biases towards other cultures and exploring in-depth one's cultural background; (2) Skill-ability to collect accurate culturally relevant patient data and performing assessments and administering interventions in a culturally sensitive manner; (3) Knowledge- having the sound education base on culturally diverse groups, biocultural ecology and addressing social determinants of health; (4) Desire- motivation to want to engage in the process of becoming culturally aware, knowledgeable, skilful and engaging with culturally diverse groups; and (5) Encounters- process of engaging in interactions with clients from diverse backgrounds to modify existing beliefs on cultural groups to prevent possible stereotyping and biases.

Cultural encounters are identified as being pivotal as a foundation for building cultural competence. It is noteworthy to highlight that the foundation principle of cultural competence is based on a dynamic learning process while integrating transcultural skills in all three learning dimensions—cognitive, practical, and affective. Cultural competence is influenced by transcultural self-efficacy, where the learning of transcultural healthcare skills, formalised educational experiences, and other learning experiences take place. Attainment of transcultural self-efficacy enhances the development of cultural competence.[17] The established link between transcultural self-efficacy and cultural competence comprises both and is viewed as the process of developing affective, cognitive, and psychomotor (practical) dimensions.[3]

The transcultural self-efficacy model is defined by Jeffreys as the confidence in undertaking transcultural healthcare among culturally different clients.[17] Three constructs -- affective, cognitive, and practical -- are embedded in Jeffreys' Transcultural Self-Efficacy Model.[17] The cognitive dimension measures confidence in knowing how cultural factors influence health care. The practical dimension measures confidence in performing motor skills including communication and assessment of clients of diverse backgrounds. The affective dimension measures confidence with respect to beliefs and values and includes self-awareness, cultural competence acceptance, advocacy, recognition, and appreciation.[17] From the definitions of cultural competence and transcultural self-efficacy stipulated above, the similarity within the domains of cultural competence (awareness, skills, knowledge, encounters and desires) and the transcultural self-efficacy constructs (affective, cognitive and practical) mainly focus on developing cultural competence skills and knowledge to effectively cater for the needs of diverse populations. It is important to note that there has been limited empirical testing of cultural competence models and definitions, and further studies are required to test the reliability and validity of these models.[3,18]

The analysis of successful teaching approaches to developing cultural competence is important as a foundation to enable improvement of healthcare services provided to minority populations. This, in turn, addresses health disparities in diagnosis, morbidity, and mortality rates within these populations.[19,20] Where language and cultural barriers are not addressed, there may be less than optimal uptake of healthcare services/interventions by these groups, leading to poorer health outcomes.[21-23]

Several systematic reviews on cultural competence education for healthcare providers have been conducted and reported previously.[12,24,25] These reviews examined intervention effectiveness; however, inclusion criteria did not specify validated outcome measures pre- and post- intervention. This review is the first to focus on assessing effective cultural competence teaching interventions in healthcare students, rather than already qualified professionals. Effectiveness is assessed using validated outcome measures. Identifying effective cultural competence interventions for healthcare students is crucial to ensure that as future healthcare professionals they receive adequate and appropriate education. This education will prepare them to serve the needs of CALD populations and work towards bridging the gap of health iniquities.

METHODS

Search Strategy

The search strategy was defined through the principles of a systematic search, using PICO (population, intervention, comparison, outcome). Databases were searched using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Guidelines for systematic reviews.[26] CINAHL, EMBASE, ERIC, PubMed and Psych INFO databases were searched systematically to identify studies reporting teaching interventions which aimed to develop cultural competence in healthcare profession students. The search was limited to articles that were published from 01 January 2010 to 31 December 2021. This search start date was selected due to significant increases in migration since 2010 arising from increased political unrests, thereby increasing cultural diversity in many host countries such as the United Kingdom, Germany, Australia, and Turkey among others.[27] The search was conducted in July 2022 and search terms used for identifying relevant studies are detailed in Appendix 1.

Inclusion and Exclusion Criteria

Research articles were considered eligible for inclusion if they met the following criteria: (1) peer reviewed (2) involved health profession students; (3) provided clear description of the teaching approach used; (4) the term “cultural competence” was in the title, abstract or was a keyword; (5) written in English; and (6) utilised one or more validated outcome measures pre- and post-intervention. Articles were excluded if the following criteria applied: (1) the term “cultural competence” was not in the title or abstract or was not a key word; (2) not written in English; and (3) did not use a validated measure pre- and post- intervention. Validated tools were those for which reliability (able to produce consistent results) and validity (ability to produce true results) had been determined and previously reported in literature.

Data Extraction Strategy and Validity Assessment

To reduce the risk of bias, eligible studies were assessed using a checklist to confirm conformity to the inclusion/exclusion criteria. Each criterion was allocated a ‘yes’ or ‘no’. The first researcher (GN) screened articles for eligibility and the selected articles were reviewed by two researchers (CL & IS). Where consensus could not be reached regarding the inclusion and/or exclusion of an article, a fourth reviewer (GK) contributed to the final decision. An Excel spreadsheet was used to tabulate data extracted from studies selected for the systematic review. The following data from selected studies were extracted; student professional group, number of students and country of origin of participants, intervention and tool(s) used pre- and post-intervention to evaluate the teaching approach.

Risk of Bias in Individual Studies

The Evaluation Tool for Quantitative Research was used to assess quality of quantitative studies.[28] For quantitative studies, the following criteria were used: study evaluative overview; study setting and sample; ethics; group comparability and outcome measurement; policy and practice implications; and other comments (Appendix 2). The Mixed Methods Appraisal Tool was used to assess quality of mixed methods studies (Appendix 3).[29]

RESULTS

Study Selection

The searches from the five databases (CINAHL, EMBASE, ERIC, PubMed and Psych INFO) yielded results as illustrated in PRISMA flowchart (Figure 1). After removing duplicates, 2,020 articles were screened for the term “cultural competence” in the title, abstract or as a key word depending on the database. After title, abstract or key word screening, 1,920 studies were assessed for eligibility. Additional hand searches were conducted by checking reference lists and systematic reviews to identify additional studies. After full text screening, 41 studies were identified as eligible for analysis. All the selected quantitative studies were of high quality where the expectation was that out of the six sub-sections, at least five should have been addressed in the article based on the Evaluation Tool for Quantitative Research Tool (Appendix 2).[28] Eight mixed methods studies included were assessed for quality based on the Mixed Method Appraisal Tool,[29] and all scores were above 71% indicating a high-quality category (Appendix 3).

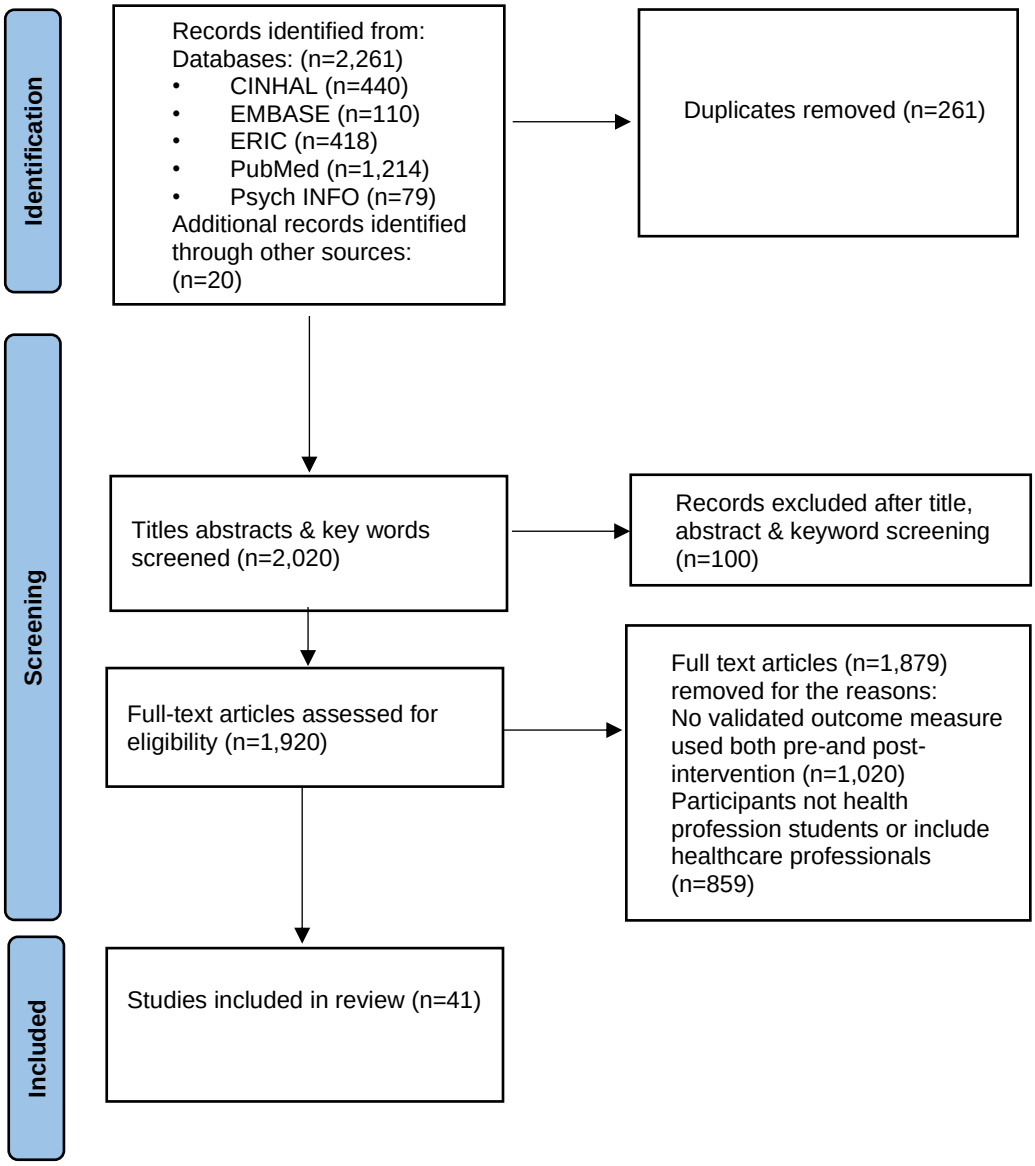

Figure 1. Adapted PRISMA 2020 Flowchart

Summary of Studies Included

Table 1 shows the 41 studies included for analysis on teaching cultural competence explicitly to healthcare profession students. Of the 41 selected studies the majority were conducted with students from the USA (n=31).[2,30-59] The remainder were conducted with Korean (n=1),[60] Australian (n=4),[61-64]Taiwanese (n=2),[65,66] Israeli (n=2),[67,68] and Polish (n=1)[69] students. Most of the studies were quantitative studies (n=33) as illustrated in Appendix 2 and a minority used the mixed methods approach (n=8) as illustrated in Appendix 3, where qualitative data were collected through focus groups, interviews /reflective accounts, and written assessments post-intervention. Of the 41 studies, most studies assessed cultural competence and domains of cultural competence (n=34),[30,32-35,37-44,47-54,56-58,60-69] those that assessed transcultural self-efficacy were in the minority (n=7).[2,31,36,45,46,55,59]

Table 1. Summary of Included Articles

Article details	Population-Student professional group, number of students and country of origin of participants	Brief description of intervention	Comparison-Tool(s) used pre- and post-intervention to evaluate the teaching approach	Outcome-Main study findings (quantitative data)
Alrqiq et al. (2015)	187 dental students United States of America	Cultural Competency curriculum comprised; 1) two two-hour lectures on cultural competence; 2) experiential learning experiences; and 3) a series of discussion seminars.	Validated questionnaire comprising 11 items used previously for pharmacy students and modified for pre-clinical dental students.[99]	Significant (P< .001) improvements in knowledge and skills in providing culturally competent care scores except for the awareness component (P= 0.3).
Amerson (2010)	69 nursing students enrolled in a community nursing course United States of America	Learning-Immersion experience in Guatemala.	Transcultural Self-Efficacy Tool an 83-item validated tool.[76, 103]	Significant (P< .001) improvements in all the three subscales - affective, cognitive, and practical.
Boggis (2012)	17 occupational therapy (OT) students and 45 non-OT students. United States of America	Three years cultural competence course where the Intervention Group (IG, n=17) had OT cultural curriculum, guided by the Intercultural Developmental Continuum (IDC), which incorporated best practice concepts evidenced from the literature and tailor made to students' need. Control Group (CG, n=45) studies were not guided by the IDC.	Intercultural Developmental Continuum (IDC) comprises of 50 items 5-point Likert scale to measure the level of intercultural sensitivity.[87,88]	IG showed a non-significant change in overall developmental orientation mean scores from pre-test to post-test (P= 0.41) and no significant increase (P> .005) in overall cultural competency. However, the intervention mitigated cultural competence decrease. CG showed a significant decrease in developmental orientation mean scores at post-test (P< .001).
Byrne (2020)	38 nursing students United States of America	A specifically designed cultural competence lecture and simulations with standardised patients. One group had a lecture only and the other group had a lecture and simulation.	Inventory for Assessing the Process of Cultural Competence among Healthcare Professionals student version (IAPCC - SV).[73]	No significant difference (P= 0.734) between those who received the lecture only and those who received the lecture plus simulation.

Article details	Population-Student professional group, number of students and country of origin of participants	Brief description of intervention	Comparison-Tool(s) used pre- and post-intervention to evaluate the teaching approach	Outcome-Main study findings (quantitative data)
Chang (2017)	120 students from nursing, pharmacy, and nutrition Taiwan	Specifically designed cultural competence course delivered through Facebook for the Intervention Group (IG, n= 65), no intervention for the Control Group (CG, n=55).	Pre-validated 49-item Cultural Competence Scale for Pre-Graduated Students to Licensed Professionals (CC-SP).[85]	No significant differences (P> .005) in knowledge, self-efficacy, or skills between groups after the cultural competence course delivered through Facebook. At months 6–9, the IG recorded significantly higher cultural competence awareness than the CG. In both the IG and the CG mean self-efficacy scores declined over time.
Chen et al. (2012)	26 nursing students United States of America	Service–learning, Intervention group (IG, n=13) conducted the following: (a) orientation, (b) a presentation related to culturally sensitive health care, (c) volunteer clinic service and (d) reflective journaling. Control group (CG, n=13) had volunteers who did not participate in service-learning activities.	IAPCC -SV.[73]	The intervention group had significant improvements on all scores (P< .005) in the domain of cultural knowledge and overall cultural competence after the project completion with no improvement in the control group.
Classe-Cutrone et al. (2017)	239 dental hygiene students United States of America	Combination of rotations including jails, hospitals, schools, public clinics, and nursing homes.	Cultural Competency Questionnaire (CCQ).[82]	Significant increase (P< .005) in cultural competence scores was associated with; amount of time spent in community rotations, number of community rotations, types of community rotations, diversity of patient pools, diversity of students and cultural competence training.

Article details	Population-Student professional group, number of students and country of origin of participants	Brief description of intervention	Comparison-Tool(s) used pre- and post-intervention to evaluate the teaching approach	Outcome-Main study findings (quantitative data)
Creech et al. (2017)	344 nursing students United States of America	Revision of all 34 courses in the curriculum to include at least one cultural competence objective in each course of the program.	Transcultural Self-Efficacy Tool.[78]	Significant (P< .005) improvements in all the three subscales- affective, cognitive, and practical.
Daugherty, Kearney (2017)	28 dental hygiene students United States of America	Online training module-Office of Minority Health Cultural Competency Program for Oral Health Professionals.	Inventory for Assessing the Process of Cultural Competence- Student Version (IAPCC-SV).[75]	Significant (P< .005) improvements in cultural knowledge and skill domains scores.
de Diego-Lázaro et al. (2020)	16 speech-language pathology and audiology students United States of America	Two service-learning study abroad programs.	Cultural Awareness and Competence Scales (CACS).[95]	Significant (P< .005) increases in the following scores: cultural awareness, competence, and self-efficacy. Improved cultural self-efficacy and cultural awareness highly correlated with students' clinical ratings in cultural competence as per their supervisors' assessments.
Denton et al. (2016)	52 physiotherapy students United States of America	1. Classroom module including readings, limited lectures, discussions, application activities and self-reflection. 2. Two 2-hour cross-cultural activities where local refugee clients were provided wellness assessments and recommendations.	Inventory for Assessing the Process of Cultural competence Among Healthcare Professionals-Student Version (IAPCC-SV©).[73]	Significant (P< .005) improvement in cultural competence, cultural knowledge, and cultural skill after participating in classroom activities. Cross-cultural activities further improved overall cultural competence. Combining classroom and cross-cultural activities resulted in greater improvements in overall cultural competence and all the five domains (cultural awareness, skills, encounters, knowledge, and desires) of cultural competence.

Article details	Population-Student professional group, number of students and country of origin of participants	Brief description of intervention	Comparison-Tool(s) used pre- and post-intervention to evaluate the teaching approach	Outcome-Main study findings (quantitative data)
Fioravanti et al. (2018)	183 nursing students United States of America	Addiction training program specifically focussing on cultural sensitivity. The program included cultural competency education, simulation and educating students to use screening, brief intervention, and referral to treatment for alcohol and other drug use.	Cultural competence Assessment tool based on the cultural components of fact, knowledge, attitude, and behavior.[89]	Significant (P< .005) improvement in cultural awareness, sensitivity and cultural competence and behaviour from pre-simulation to post-simulation experience. Significant (P< .005) improvement in cultural competence and behaviour, pre-simulation to post-simulation.
Fryer et al. (2021)	73 physiotherapy students Australia	4-week tutorial module designed based on Purnell's model of cultural competence. Module covered; cultural immersion, cultural awareness, cultural difference, and cross-cultural communication.	Cultural competence was measured using the 20-item Cultural Intelligence Scale (CQS).[92]	Significant (P< .005) improvement in the cultural intelligence scores. Students who were not born in Australia, or who had a parent not born in Australia, demonstrated less change in overall cultural intelligence score than Australian-born participants.
Glickman (2015)	17 students from schools of law, medicine, nursing, pharmacy, and social work United States of America	Both control and intervention groups completed an online module. The Intervention Group (n=9) also had a 6-week global immersion experience in a less-resourced country. Control Group (n=8).	Cross-Cultural Adaptability Inventory (CCAI).[96]	Significant improvement (P< .005) in the Emotional Resilience and Perceptual Acuity variables for the intervention group but not for the control group. No significant difference (P> .005) in the Personal Autonomy and Flexibility Openness component scores in both groups. Significant improvement (P< .005) in cross-cultural adaptability after participating in a 6-week global immersion experience compared to education only.

Article details	Population-Student professional group, number of students and country of origin of participants	Brief description of intervention	Comparison-Tool(s) used pre- and post-intervention to evaluate the teaching approach	Outcome-Main study findings (quantitative data)
Gower et al. (2019)	23 nursing students Australia	International Clinical Placement in Asia.	Inventory for Assessing the Process of Cultural Competence-Revised.[72]	Significant improvement (P< .005) in the domains of cultural awareness, skills, knowledge, encounters, and desires from Time 1 (within a week prior to the placement) to Time 2 (2 weeks after returning from placement). No significant improvement (P= .890) in the domains of cultural awareness, skills, knowledge, encounters, and desires 12 months after returning from placement.
Hayward (2014)	14 physical therapy students United States of America	Study abroad experiences at orphanages. The program entailed learning about the Ecuadorian culture, cultural awareness activities and design of appropriate therapeutic interventions.	Assessing the Process of Cultural Competence Among Healthcare Professionals–Student Version (IAPCC-SV).[74]	Significant improvements in overall cultural competence (P< .005).
Housman et al. (2012)	37 health education students United States of America	Intervention Group (n=17) experienced a three-week service-learning project with members of a low-income community. Control Group (n=20) participated in an ordinary community health course.	Cultural competence Assessment (CCA).[89]	The Intervention Group had significant (P< .005) higher mean scores in cultural competence behaviour than the control group. The Control Group had increased perceived self-efficacy and cultural competence.
Hunter, Krantz (2010)	76 nursing students United States of America	Course comprised of units based on Campinha-Bacote's (2003) four constructs: cultural awareness, knowledge, skill, and encounters. Sessions comprised readings, an assignment and discussion questions.	Inventory for Assessing the Process of Cultural competence Among Healthcare Professionals Revised (IAPCC -R).[71]	Significant (P< .005) improvements in domains of cultural knowledge, skill, desire, and overall competence. The untaught construct of cultural desire showed the most statistically significant improvement (P< .005).

Article details	Population-Student professional group, number of students and country of origin of participants	Brief description of intervention	Comparison-Tool(s) used pre- and post-intervention to evaluate the teaching approach	Outcome-Main study findings (quantitative data)
James et al. (2021)	62 nursing students United States of America	Culture Course; weekly 1-hour lectures over 15 weeks covering topics such as cultural concepts and theories and 45 hours of observational experiences through; visits to museums, religious institutions, and cemeteries, and festivals and celebratory activities such as powwows.	Jeffreys' Transcultural Self-Efficacy Tool.[80]	Significant (P< .005) improvements in overall transcultural skills efficacy and in all the three subscales affective, cognitive, and practical. Upon graduation, the intervention group's scores were statistically significantly (P< .005) higher than those of the control group in all domains except the affective domain.
Jeffreys, Dogan (2012)	147 nursing students. United States of America	Cultural competency integrated throughout curriculum, inclusive of clinical rotations in critical care, mental health, pediatrics, and maternity/nursery.	Transcultural Self-Efficacy Tool.[78]	Significant improvements (P< .05) in all the three domains of affective, practical and cognitive in the longitudinal tests and significant improvements (P <0.05) in the cognitive domain in the cross-section tests.
Knecht et al. (2019)	53 nursing students United States of America	The intervention group (IG, n=25) had clinical practice program in diverse clinical settings and the control group (CG, n=28) had clinical practice program in traditional community settings.	Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals-Student Version (IPACC-SV)®.[75]	Significant (P< .001) increase was demonstrated in knowledge, skills, encounters, and desires in both groups. The intervention group scored higher compared to students who participated in the more traditional, less diverse clinical experiences.
Kohlbry (2016)	121 nursing students United States of America	International Immersion Service-learning project.	Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals-Student Version[74] and Cultural Self-Efficacy Scale (CSES).[83]	Significant (P< .005) improvements in the cultural competence constructs of cultural skills and knowledge but not in the domains of awareness, desires and encounters constructs of cultural competence.

Article details	Population-Student professional group, number of students and country of origin of participants	Brief description of intervention	Comparison-Tool(s) used pre- and post-intervention to evaluate the teaching approach	Outcome-Main study findings (quantitative data)
Kula et al. (2021)	72 nursing students Israel	Intervention group (IG, n=34) engaged in cultural competence program. The Control Group (CG, n=38) did not receive this intervention.	Clinical Cultural Competency Questionnaire (CCCQ).[82]	Significant improvement (P< .005) in cultural competence scores at the basic knowledge and understanding levels in both groups, but not in attitudes and encounters domains. No group differences between the control group and intervention group were identified in the attitudes and the encounters domains.
Levey (2019)	37 nursing students United States of America	16 week online cultural diversity course.	Cultural Competency Assessment (CAS).[90]	Significant (P< .005) improvements in mean scores in CAS subscales of cultural awareness and sensitivity.
Lin et al. (2015)	105 nursing students Taiwan	The intervention group (IG, n= 51) engaged in a cultural competence course. Course included lectures, student projects, and a final examination. The control group (CG, n=54) did not receive this intervention.	Cultural Competence Assessment Instrument-Chinese Version (CCA-CV).[89]	Both the intervention group and control group had significant improvements in mean scores (P< .001). However, the IG had significantly higher mean scores compared to the control group. Overall effectiveness of the training diminished with time between 6-8 months post-graduation.
Long (2016)	18 students; 16 student nurses and 2 others United States of America	Community immersion program of training in language, culture, and community nursing comprised of a week-long service-learning medical experience; structured formal classroom learning and community nursing in remote villages and hospital.	Cultural Self Efficacy Scale.[84]	Significant (P< .001) improvements in self-efficacy, awareness, and self-confidence.

Article details	Population-Student professional group, number of students and country of origin of participants	Brief description of intervention	Comparison-Tool(s) used pre- and post-intervention to evaluate the teaching approach	Outcome-Main study findings (quantitative data)
Majda et al. (2021)	130 nursing students Poland	Intercultural communication workshops comprising practical classes and subsequent lectures.	Cross-Cultural Competence Inventory (CCCI) and the Cultural Intelligence Scale (CQS) questionnaires.[93,94]	Significant (P< .001) improvements in overall results in cultural intelligence, behavioural and cognitive subscales. The cultural competence results were also higher overall post-intervention, but the difference was not insignificant (P> .005).
Meaux et al. (2021)	10 occupational therapy and 3 nursing students United States of America	Short-term Costa Rican study abroad experience.	Cultural Competency Questionnaire (CCQ).[97]	Significant improvement (P< .001) in knowledge and skills. No significant differences in cultural awareness (P> .05).
Mihalic et al. (2010)	160 paediatrics students United States of America	Cultural competence curriculum comprising didactic workshops, web-based multimedia case exercises and a Cultural and Linguistic Competence Pocket Guide.	Evaluation included a student satisfaction survey and a validated knowledge test.[104]	Significant (P< .001) improvements in cultural knowledge in cultural competence assessments scores.
Musolino et al. (2010)	2,124 Interdisciplinary Health Sciences Students — medicine pharmacy nursing, physical therapy and others United States of America	Cultural Competency and Mutual Respect program, comprised of 4 modules; Accountability & Mutual Respect, Attitudes, Beliefs & Expectations: Disparity of Care & Relationships, Systems Diversity: Solutions to Cultural Clashes and Cross-Cultural Communication.	Campinha-Bacote's Inventory for Assessing the Process of Cultural Competence-Revised (IAPCC -R©).[71]	Significant (P< .005) improvements were attained by all disciplines in scores for the cultural constructs of attitudes, knowledge, and skills, but not encounters and desires.
Muzumdar et al. (2010)	105 pharmacy students United States of America	1-year cultural competence curriculum.	A 32-item questionnaire,[99] survey items were adapted from the literature available on cultural competence in pharmacy curricula.	Significant (P< .005) improvements in knowledge and perceived confidence activities.

Article details	Population-Student professional group, number of students and country of origin of participants	Brief description of intervention	Comparison-Tool(s) used pre- and post-intervention to evaluate the teaching approach	Outcome-Main study findings (quantitative data)
Noble et al. (2014)	146 nursing students Israel	The intervention group (IG, n=58) received standard lectures and lecture on cultural competence where students gave a group presentation about a cultural group in Israel, based on Campinha-Bacote's five constructs. The control group (CG, n=88) received the standard classes that were traditionally taught in the Introductory to Nursing course which did not include a formal lecture on culture or cultural competence.	Inventory for Assessing the Process of Cultural competence among Healthcare Professionals–Revised version.[72]	Significant (P< .005) improvement in overall cultural competence in the intervention group, but not in the control group. For all five subscales, pre- and post-test scores were greater in the intervention group than in the control group.
Ozkara San (2019)	53 nursing students United States of America	Diverse Standardized Patient simulation cultural competence education strategy which comprised of simulation scenario design, evaluation, implementation, and simulated patients training processes.	Transcultural Self-Efficacy perceptions using the validated tool, the Transcultural skills efficacy Tool.[80]	Significant (P< .001) increase in students' transcultural self-efficacy perceptions. All students regardless of background benefited from formalised cultural competence education.
Olson et al. (2016)	427 health professional students Australia	Learning activity consisting of three case-based narrative video-recordings and a reflective tutorial.	California Brief Multicultural Competency Scale[98], revised to fit future professions rather than explicitly focusing on mental health and American cultural group.[105]	Significant (P< .001) improvement in cultural competence scores.
Park et al. (2019)	62 nursing students Korea	13-week cultural nursing course.	Cultural competence Scale for Korean Nurses.[91]	Significant (P< .001) in the cultural competence categories of cultural awareness, cultural knowledge, cultural sensitivity, and cultural skills.

Article details	Population-Student professional group, number of students and country of origin of participants	Brief description of intervention	Comparison-Tool(s) used pre- and post-intervention to evaluate the teaching approach	Outcome-Main study findings (quantitative data)
Peiying et al. (2012)	16 final-year health professions students from physiotherapy, occupational therapy, and speech therapy Australia	A 4-week placement in China or India.	A validated tool the Intercultural Development Inventory (IDI).[86]	Significant (P< .005) improvement in the Acceptance/Adaptation scale. Overall IDI developmental mean scores and individual scale scores increased without statistical significance (P=0.10).
Roller, Ballestas (2017)	18 nursing students United States of America	Elective course that included classes and a one-week immersion study abroad in Costa Rica.	A validated tool the IAPCC-Revised Version was used.[71]	Significant (P< .001) increase in cultural competency at the end of the study abroad program which was maintained one year post study abroad program.
Sales et al. (2013)	108 pharmacy students United States of America	Lecture, case scenario and simulation.	Survey validated in the literature by Sealey et al.[106] and original questions developed by the investigators based on themes from previously published questions in the literature.[107]	Simulation group had statistically significant improvements (P<. 001) in the cultural skills and desire components. The case-scenario group experience significant improvements (P< .001) in the cultural awareness component and in the lecture group there were statistically significant improvements (P< .001) in the cultural skills and cultural empathy components.
Singleton (2017)	89 nursing students United States of America	Enhanced Cultural competence Curriculum.	Transcultural Self-Efficacy Tool[80].	Significant (P< .005) improvements in the overall transcultural self-efficacy.
Vyas, Caligiuri (2010)	25 pharmacy Students United States of America	A 6-week pharmacy practice experience teaching program comprised of patient care scenarios, religious forum, socio-economic session, and health disparities presentations.	Survey adapted from Westberg et al. [108] and Dogra.[109]	Students were more aware of their own health beliefs after teaching program exposure (P= 0.022). There was also a significant change in attitudes regarding the need for pharmacists to be aware of the different cultures within their practice (P= 0.046).

Article details	Population-Student professional group, number of students and country of origin of participants	Brief description of intervention	Comparison-Tool(s) used pre- and post-intervention to evaluate the teaching approach	Outcome-Main study findings (quantitative data)
Young et al. (2021)	103 nursing students United States of America	Didactic leadership course for five weeks to ultimately increase students' self-efficacy to care for the Burmese Chin refugees.	Jeffreys' Transcultural Self-Efficacy Tool.[81]	Statistically significant (P< .005) improvements in all the three subscales of affective, cognitive, and practical.

**Campinha-Bacote's five domains or constructs referenced are cultural awareness, cultural skills, cultural encounters, cultural desires, and cultural knowledge. Jeffreys' Transcultural Self-Efficacy subscales referenced are cognitive, affective, and practical.*

Types of Intervention and Duration of Exposure

The most frequently referenced interventions were engaging with communities through placements, service learning abroad, community rotations, observational experiences involving visits to museums, religious institutions, cemeteries, festivals and structured volunteer service learning in remote communities of developing countries.[31,34,35,37,41,43,47-51,56,62,64] To mimic engaging with patients as in immersion courses, simulations with standardised patients were also used in four studies.[33,40,55,57]

International immersion courses and placements enhanced transcultural self-efficacy and improved most areas of cultural competence even though they were generally short,[31,34,35,37,41,43,47-51,56,62,64] compared to traditional teaching interventions such as lecture programs in some cases lasting up to three years.[2,32,53] The results from studies that utilised immersion courses and placements abroad, indicated evidence of significant increases (p< .005) in at least one cultural competence domain or one transcultural self-efficacy domain.[31,34,35,37,41,43,47-51,56,62,64] It was suggested in two studies that activities used in the immersion course should be for augmentation of cultural competence, rather than utilised for first exposure and they were reported as beneficial in developing a specific domain such as cultural desire.[52,57] The use of stand-alone traditional classroom teaching methods such as lectures was not implemented in any study, but instead was combined with cross-cultural activities, clinical rotations, simulations, reflections and diverse population engagements locally or abroad to enhance cultural competence efficacy. In some cases, students were consulted about the course design to address the students' cultural competence needs.[32,40,55,63] One study had a unique design where cultural competence was implemented throughout the entire nursing curricula with the expectation that at least one cultural competence objective was incorporated into each course of the nursing program.[36]

Table 2 displays the intervention types for each of the papers summarised in Table 1.

Table 2. Summary of Intervention Elements

Article Details	Lectures, Other Materials	Seminars/ Discussions	Role play/ Simulation	International	Local
	Online and Face to Face			Immersion/ Service Learning	
Alrqiq et al. (2015)	■	■			■
Amerson (2010)				■	
Boggis (2012)	■	■	■		■
Byrne (2020)	■	■	■		
Chang (2017)	■	■	■		
Chen et al. (2012)					■
Classe-Cutrone et al. (2017)					■
Creech et al. (2017)	Integrated Curriculum Elements Not Specified				
Daugherty, Kearney (2017)	■				
de Diego-Lázaro et al. (2020)				■	
Denton et al. (2016)	■	■			■
Fioravanti et al. (2018)	■		■		
Fryer et al. (2021)		■			
Glickman (2015)	■			■	
Gower et al. (2019)				■	
Hayward (2014)				■	
Housman et al. (2012)					■
Hunter, Krantz (2010)	■	■			■
James et al. (2021)	■				■
Jeffreys, Dogan (2012)	■	■	■		
Knecht et al. (2019)					■
Kohlbry (2016)				■	
Kula et al. (2021)	■				
Levey (2019)	■	■			
Lin et al. (2015)	■	■			
Long (2016)	■			■	
Majda et al. (2021)	■	■	■		
Meaux et al. (2021)				■	
Mihalic et al. (2010)	■	■			
Musolino et al. (2010)	■				
Muzumdar et al. (2010)	■	■			■
Noble et al. (2014)	■				
Ozkara San (2019)			■		
Olson et al. (2016)	■	■			
Park et al. (2019)	■	■			■
Peiying et al. (2012)				■	
Roller, Ballestas (2017)	■			■	
Sales et al. (2013)	■	■	■		
Singleton (2017)	■	■			
Vyas, Caligiuri (2010)	■	■			
Young et al. (2021)	■				

**Grey shading indicates that the intervention element was utilised in the corresponding article.*

In studies where data from a control group was reported, the control groups were mostly allocated the standard classroom teaching methods such as standard lectures, whereas the intervention groups were allocated specialised cultural competence courses sometimes combined with cultural immersion experience /clinical practice/simulations.[32-34,41,43,65,67,68] Of note, only one study by Knecht et al.[47]undertook a comparison between a traditional and a diverse setting community service program.

The longest duration of exposure was evidenced in three studies where healthcare profession students had three years of cultural competence learning which entailed web-based teaching and learning, assessments, self-reflective and awareness tasks on cultural competence, implementing culturally sensitive evidence-based practice approach to clinical questions and modular courses.[2,32,53] The average duration for most of the studies that reported duration of exposure to the intervention was at least one week.

Participant Characteristics

Healthcare profession student participants were from the following disciplines: nursing, medicine, pharmacy, nutrition, dentistry, physical therapy, occupational therapy, language pathology and audiology, and other unspecified healthcare disciplines. Studies where nurses were the only participants were the most common (n= 21 studies),[2,31,33,34,36,40,44-49,55,56,59,60,62,66-69] of the 41 studies. Ten studies combined healthcare profession students from different healthcare disciplines.[32,37,41,43,50,51,53,63-65] In another ten studies, participants were all from the same disciplines that is dental, physiotherapy, pharmacy and paediatrics.[30,35,38,39,42,52,54,57,58,61] The study which had the highest number of participants (n=2,124) was Musolino et al.[53] and Meaux et al.[51] study had the lowest number of participants, with only ten occupational therapy doctoral students and three nursing students (n=13).

Classification of Outcome Measures

Validated Published Measures

The most frequently referenced psychometric tools used to assess outcome measures pre- and post-intervention were those by Campinha-Bacote and Jeffreys. Several versions of Campinha-Bacote's Inventory for Assessing Cultural Competence among Healthcare Professionals-Revised (IAPCC-R) and Student Version (IAPCC-SV) tools,[70-75] were used in studies for assessing the cultural competence domains of awareness, knowledge, skills, desires and encounters.[33,34,38,39,42,44,47,48,53,56,62,68] Several versions of Jeffreys' Transcultural Self-Efficacy Tools,[76-81] were used in studies for assessing transcultural self-efficacy changes in the cognitive, practical, and affective subscales.[2,31,36,45,46,55,59] Campinha-Bacote and Jeffreys' validated psychometric tools were frequently used in assessing cultural competence domains within nursing students.

The Clinical Cultural Competency Questionnaire[82] used by Kula et al.[67] and Classe-Cutrone et al.[35] assessed the same cultural competence domains of skills, knowledge and encounters and additionally culturally competent attitudes. One study by Kohlbry[48] combined Campinha-Bacote's (IAPCC-SV)[74] with the Cultural Self-Efficacy Scale developed by Bernal and Froman.[83,84] Several other validated tools used in studies were: Cultural competence Scale for Pre-Graduated Students to Licensed Professional,[85] Intercultural Development Inventory,[86] Intercultural Developmental Continuum,[87,88] Cultural Competence Assessment,[89] Cultural Competency Assessment,[90] Cultural Competence Scale for Korean Nurses,[91] Cultural Intelligence Scale,[92] Cross-Cultural Competence Inventory,[93,94] Cultural Awareness and Competence Scales,[95] Cross-Cultural Adaptability Inventory,[96] Cultural Competency Questionnaire,[97] and California Brief Multicultural Competency Scale.[98]

Internally Validated Measures

Eight studies had self-reported outcome measures internally validated by cultural competence experts and faculty members.[30,37,49,52,54,58, 63,65] The internal experts / faculty members validated self-designed assessments or modified previously published validated measures, survey questions, questionnaires, and tests.[30,57] An internally validated questionnaire for pharmacy students by Assemi et al.[99] was modified for pre-clinical dental students. These revisions and consultations were designed to suit participant needs and to fit the study purpose. The Cultural Awareness and Competence Scales[37] were unique scales, adapted for use with speech-language pathology and audiology students. One study by Mihalic et al.[52] used different methods for pre- and post-intervention assessments, which included a self-report measure pre-intervention and a non-self-report outcome measure post-intervention (an examination) to test cultural competence knowledge.

Evaluation of Intervention Impact

All 41 studies included showed positive outcomes post-cultural competence intervention exposure in the domains of cultural competence or transcultural self-efficacy subscales. In thirteen studies where the Campinha-Bacote's IAPCC Tool was used, the pre- and post-intervention analyses showed significant differences *($p<0.05$)* in overall cultural competence or in at least two of the five domains of cultural competence.[33,34,38,39,42,44,47,48,53,56,57,62,68]

One study deliberately did not assess the cultural desires domain, with the explanation that the cultural desires domain is not easily attainable through teaching but is rather acquired after gaining more efficacy in the other four domains: awareness, skills, knowledge and encounters.[44] In six studies where transcultural self-efficacy was assessed, significant ($p\leq 0.05$) positive changes were reported in all three domains of; cognitive, practical, and affective learning and overall transcultural self-efficacy skills.[2,31,36,45,55,59]

Effective Cultural Competence Interventions for Healthcare Students

Simulation courses, used for teaching cultural competence, were effective as most students reported knowledge improvement in cognitive, practical, and affective learning. There were improved overall mean scores in transcultural self-efficacy and in some or all cultural competence domains as students practiced how to handle diverse cultural issues in a safe and familiar environment through simulation learning.[31,33,40,55,57] Findings from 16 studies reported that; enhancement of cultural competence domains of cultural awareness, desires and sensitivity required more of a hands-on or interactive approach while engaging with culturally diverse communities through community service learning and international clinical placements.[31,34,35,37,41,43,47-51,54,56,62,64,68] Transcultural self-efficacy mean scores significantly improved when students engaged in activities with a minority group of refugees.[59] Significant cultural competence improvement was reported when teaching methods incorporated, engaging with communities of diverse populations or conducting activities that mimicked community engagement such as role-plays or simulations.[33,40,54,57]

In a study by Chang,[65] the intervention group had a specifically designed cultural competence course delivered through a social media platform (Facebook), while the control group had no cultural competence training. In both groups, there was an unexplained decline of mean self-efficacy scores between 6-9 months. However, the intervention group demonstrated an increase in cultural competence awareness scores that remained higher from the immediate post-test to program exit compared to the control group that had no cultural competence training.[65] In contrast, a randomised study reported by Byrne[33] showed that there was no significant difference (p=.734) between the control group who received the lecture and the intervention group who received the lecture plus simulation. However, there were significant changes (p <. 001) in mean scores for all students from pre-intervention to post-intervention.[33]

It is apparent that the most effective interventions for teaching cultural competence are those that incorporate interactive hands-on approaches through engaging with people from diverse cultural backgrounds in community engagement programs locally or abroad. In situations where face to face contact is not possible simulations were also found to be effective where interactive hands-on approach is mimicked.

Evaluation of Interventions Using Qualitative Data

Derived themes from the qualitative analysis included increased vigilance and adaptation to environment, uncertainty and anticipation, grappling with supremacy, recognising and appreciating differences, and cultural immersion and development where students highlighted how the cultural competence intervention had enhanced their skills of working with culturally diverse populations.[64] Some of the themes that emerged from these studies such as: “enlightenment,” “competence and connection,” and “beliefs and attitudes” are reflective of how students’ perceptions, opinions and biases affected cultural competence development.[43,47,51] Interaction between the imposed service-learning environment and participants’ personal factors such as knowledge, attitudes and perceptions enabled students to construct a more culturally competent environment for practice.[43] Post-intervention, students reported the ability to (1) deconstruct pre-conceived beliefs and stereotypes about people from a different culture; (2) improve self-efficacy and skills related to delivery of health education; and (3) to demonstrate behaviours that closely aligned with the concept of cultural competence.[43,51] In all studies that utilised qualitative data from interviews, reflections and focus groups students expressed satisfaction on how the interventions used to teach cultural competence enhanced their cultural competence and confidence working with culturally diverse populations, enabled them to self-evaluate their cultural competence and they acknowledged the importance of cultural competence in healthcare.[33,42,43,47,50,51,63,65,68]

DISCUSSION

Interpretation of Evidence

Most studies included in this review used either published or internally validated self-report outcome measures, even though the use of self-report outcome measures has been criticised previously by Loftin et al.[100] due to the potential of bias. Only one study out of the 41 studies used a non-self-report outcome measure — an assessment test.[52] Randomisation was used in only eight studies while the remainder of the studies (n=33) were non-randomised — an indication on the challenge of implementing randomisation in educational interventions.[101] Randomisation is perceived most effective in examining relatively standardised interventions, such as web-based learning and clinical simulations as appropriate cultural competence interventions.[102] The comparison between types of interventions or different psychometric tools to evaluate reliability and validity could be a possibility of where randomisation could be used.

Our findings have highlighted the research gaps in identifying effective approaches to teaching cultural competence. Based on this review, it is apparent that there is a need for further research on the appropriate interventions, appropriate duration of exposure in the domains where it is difficult to elicit change and identify mitigating factors. There was evidence that the overall cultural

competence diminished post-intervention, with scores in some domains such as awareness, skill and desire decreased soon after post-intervention and 12 months later for the encounter domain.[65,66]

A range of psychometric tools such as Campinha-Bacote and Jeffreys' tools were used in the reviewed studies for assessing cultural competence and Transcultural self-efficacy skills. However, none of the studies compared these evaluation tools. It would be useful for the designing of cultural competence interventions to ascertain through research the following: (1) duration of exposure for attaining optimum cultural competence efficacy; (2) most efficacious combination of interventions; (3) how long interventions may be sustained for post-intervention exposure; and (4) the most effective non-self-report outcome measure.

It is imperative to identify the correlations between demographics of students especially age and interventions, on how they may influence learners' short-term or long-term cultural competence gains. It is essential to understand how engagement in or being open to cross-cultural encounters and which learning methods promote retention. The above-mentioned relationships and correlations within or between demographic groups could potentially inform curriculum design that could influence positive educational outcomes.

Several studies used mixed methods approach where both qualitative and quantitative methods were used to collect data. The use of the mixed method approach is comprehensive, where intervention assessment tools were combined with collection of data through reflections, focus groups and interventions evaluation. The students' perceived cultural competence self-efficacy improvements supported cultural competence measured through validated tools where students acknowledged the positive influence of interventions on their cultural competence. Themes that emerged from the qualitative data such as acquisition, refinement and use of culturally relevant language and deconstruction of stereotypes and biases highlighted high level of cultural competence. The impact of cultural competence interventions that are perceived to elicit behaviour change require further investigation to ascertain their effectiveness in role modelling.

Review of Strengths and Limitations

Review strengths include its conduct following the PRISMA guidelines for conducting systematic reviews. Five databases (CINAHL, EMBASE, ERIC, PubMed, and Psych INFO databases) were searched. It is the first review explicitly focusing on healthcare profession students whereas other reviews include healthcare professionals for whom learning approaches and opportunities may be quite different. Only quality studies were included in this review with the risk of bias assessment conducted using validated evaluation tools for mixed method studies and quantitative studies.[28,29.] The review not only identified studies that used validated outcome measures but also somewhat effective interventions for teaching cultural competence and appropriate duration of intervention exposure. Future studies may be informed by our findings to investigate further effective cultural competence interventions with long sustainability.

A limitation of this systematic review is the strategy of screening which included the screening of titles, abstracts, and key words to include "cultural competence"; this may have led to some relevant studies being excluded.

CONCLUSIONS

This review has evaluated the effectiveness of cultural competence interventions and evaluations of the interventions using either self-report or non-self-report validated outcome measures pre- and post-intervention. Combining cultural competence teaching methods such as lectures with simulation, role playing, and community engagement with diverse population exposure enhance cultural competence. Further studies are required to compare effective cultural competence teaching models and identify reliable non-self-report outcome measures to assess the effectiveness of interventions post-exposure. Further research is also required to examine the duration of intervention efficacy and how to maintain efficacy post-intervention exposure. Findings from this review are important for designing and structuring of cultural competence curriculum for healthcare profession students and informing future research on cultural competence teaching. A research gap exists that requires addressing where there is scarcity of cultural competence studies and specific evaluation tools focusing on other healthcare disciplines such as pharmacy and physical therapy.

References

1. Bhopal RS. Migration, Ethnicity, Race and Health in Multicultural Societies, (2nd Edition). Oxford University Press; 2014.
2. Singleton JK. An Enhanced Cultural Competence Curriculum and Changes in Transcultural Self-Efficacy in Doctor of Nursing Practice Students. *Journal of Transcultural Nursing*. 2017;28(5):516–522. https://doi.org/ 10.1177/1043659617703162. [PMID: 29308713].
3. Alizadeh S, Chavan M. Cultural competence dimensions and outcomes: a systematic review of the literature. *Health & Social Care in the Community.* 2015;24(6):e117-e130. https://doi.org/ 10.1111/hsc. 12293.[PMID: 26499469].
4. Harrad R, Cosentino C, Keasley R, Sulla F. Spiritual care in nursing: an overview of the measures used to assess spiritual care provision and related factors amongst nurses. *Acta Biomedica*. 2019;28; 90(4-S):44-55. https://doi:10.23750/abm.v90i4-S.8300. [PMID: 30977748].
5. Betancourt JR, Corbett J, Bondaryk MR. Addressing disparities and achieving equity: cultural competence, ethics, and health-care transformation. *Chest*. 2014;145(1):143–148. https://dx. doi.org/10.1378/chest.13-0634. [PMID: 24394825].
6. Jongen C, McCalman J, Bainbridge R. Health workforce cultural competency interventions: a systematic scoping review. *BMC Health Services Research*. 2018;18:232. https://doi.org/10.1186/s12913-018-3001-5
7. Sharifi N, Adib-Hajbaghery M, Najafi M. Cultural competence in nursing: A concept analysis. *International Journal of Nursing Studies*. 2019;99:103386. https://doi.org/10.1016/j.ijnurstu. 2019.10338. [PMID: 31404821].
8. Danso R. Cultural competence and cultural humility: A critical reflection on key cultural diversity concepts. *Journal of Social Work.* 2016;18(4):410-430. http://doi:10.1177/1468017316654341
9. Campinha-Bacote J, Cultural Competemility: A Paradigm Shift in the Cultural Competence versus Cultural Humility Debate – Part I OJIN. *The Online Journal of Issues in Nursing*. 2018;24:1. https://doi.org/10.3912/OJIN.Vol24No01PPT20
10. Garneau AB, Pepsin J. Cultural competence: A Constructivist Definition. *Journal of Transcultural Nursing.* 2015;26(1):9-15. https://doi.org/10.1177/104365 9614541294. [PMID: 25037305].
11. Quickfall J. Cultural competence in practice: the example of the community nursing care of asylum applicants in Scotland. *Diversity and Equality in Health and Care*. 2014;11(3):247–53. https://doi.org/10.21767/2049-5471.100013
12. Truong M, Paradies Y, Priest N. Interventions to improve cultural competency in healthcare: a systematic review of reviews. *BMC Health Services Research*. 2014:14,99. https://doi.org/10.1186/1472-6963-14-99. [PMID: 24589335].
13. Cai DY. A concept analysis of cultural competence. *International Journal of Nursing Science.* 2016;3(3):268–273. https:// dx.doi.org/ 10.1016/ j.ijnss.2016.08.002
14. Fisher-Borne M, Cain JM, Martin SL. From mastery to accountability: Cultural humility as an alternative to cultural competence. *Social Work Education.* 2015;34(2):165-181. https://doi:10.1080/ 02615479.2014.977244
15. Yancu C, Farmer D. Product or process: Cultural competence or cultural humility? *Palliative Medicine and Hospice Care Open Journal* 2017;3(1):e1-e4. https://doi:10.17140/PMHCOJ-3-e005
16. Campinha-Bacote, J. Coming to know cultural competence: An evolutionary process. *International Journal for Human Caring*. 2011;15(3):42-48. https//doi:10.20467/1091-5710.15.3.42
17. Jeffreys MR. Teaching cultural competence in nursing and health care: Inquiry, action, and innovation (3rd Edition). Springer, New York; 2016a.
18. Shen, Z. Cultural competence models and cultural competence assessment instruments in nursing: a literature review. *Journal of Transcultural Nursing*. 2015;3:308-21. https://doi.org/10.1177/104365 9614524790. [PMID: 24817206].
19. Anand K, Sepanski R, Giles K, Shah S, Juarez P. Pediatric Intensive Care Unit Mortality Among Latino Children Before and After a Multilevel Health Care Delivery Intervention. *JAMA Pediatrics*. 2015;169(4):383. https://doi.org/10.1001. [PMID: 25706478]
20. Aragaw A, Yigzaw T, Tetemke D, Amla, W. Cultural competence among Maternal Healthcare Providers in Bahir Dar City Administration, Northwest Ethiopia: Cross sectional Study. *BMC Pregnancy and Childbirth*. 2015;15(227):1-10. https://doi.org/10.1186/s12884-015-0643-8
21. Larsen R, Mangrio E, Persson K. Interpersonal Communication in Transcultural Nursing Care in India: A Descriptive Qualitative Study. *Journal of Transcultural Nursing.* 2020;32(4):310-317. https://doi.org/10.1177/1043659620920693. [PMID: 32436462].
22. Nkhoma G, Lim CX, Kennedy G, Stupans I. Reducing health inequities for asylum seekers with chronic non-communicable diseases: Australian context. *Australian Journal of Primary Health*. 2021a; 27(2):130-135. https://doi.org/10.1071/PY20091. [PMID: 33773608].
23. Nkhoma G, Lim CX, Kennedy G, Stupans I. Policies and initiatives/programs that promote health and self-care in asylum seekers living in high income countries: a narrative review. *International Journal of Human Rights in Healthcare*. 2021b;Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/IJHRH-09-2021-0165

24. Govere L, Govere EM. How effective is cultural competence training of healthcare providers on improving patient satisfaction of minority groups? A systematic review of literature. *Worldviews Evidence Based Nursing*. 2016;13(6):402–410. http://dx.doi.org/10.1111/wvn.12176. [PMID: 27779817].
25. Oikarainen A, Mikkonen K, Kenny A, Tomietto M, Tuomikoski AM, Meriläinen M, Miettunen J, Kääriäinen M. (2019). Educational interventions designed to develop nurses' cultural competence: A systematic review. *International Journal of Nursing Studies*. 2019:98,75–86. https://doi.org/10.1016 /j.ijnurstu.2019.06.005. [PMID: 31319338].
26. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, Shamseer L, Tetzlaff JM, Akl EA, Brennan SE, Chou R, Glanville J, Grimshaw JM, Hróbjartsson A, Lalu MM, Li T, Loder EW, Mayo-Wilson E, McDonald S, McGuinness LA, Stewart LA, Thomas J, Tricco AC, Welch VA, Whiting P, Moher D. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021;372:n71. https://doi: 10.1136/bmj.n71
27. United Nations High Commissioner for Refugees (2020). 1 per cent of humanity displaced: UNHCR Global Trends report Geneva, UNHCR, 2020. [cited 2022 Aug 03]. Available from: https:// www.unhcr.org/en-au/news/press/2020 /6/ 5ee9db2e4/1-cent-humanity-displaced-unhcr-global-trends-report.html.
28. Long AF, Godfrey M, Randall T, Brettle A, Grant MJ. Developing Evidence Based Social Care Policy and Practice. Part 3: Feasibility of Undertaking Systematic Reviews in Social Care;2002. https://usir.salford.ac.uk/id/eprint/13071/
29. Hong Q, Fàbregues S, Bartlett G, Boardman F, Cargo M, Dagenais, P, Gagnon M, Griffiths F, Nicolau B, O'Cathain A, Rousseau M, Vedel I, Pluye P. The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. Education for Information 2018;34(4):285-291. https://doi.org /10.3233/EFI-180221
30. Alrqiq HM, Scott TE, Mascarenhas AK. Evaluating a Cultural Competency Curriculum: Changes in Dental Students' Perceived Awareness, Knowledge, and Skills. *Journal of Dental Education.* 2015;79(9):1009-15. https://doi.org/10.1002/j.0022-0337.2015.79.9.tb05993.x. [PMID: 26329024].
31. Amerson R. The impact of service-learning on cultural competence. *Nursing Education Perspectives*. 2010;31(1):18-22. [PMID:20397475].
32. Boggis DT. Effectiveness of a Developmental Curricular Design to Graduate Culturally Competent Health Practitioners. *Journal of Allied Health*. 2012;41,3:140-6. [PMID: 22968776].
33. Byrne D. Evaluating Cultural competence in Undergraduate Nursing Students using Standardized Patients. *Teaching and Learning in Nursing.* 2020;15(1):57-60. https://doi.org/10.1016/ j.teln.2019.08.010
34. Chen HC, McAdams-Jones D, Tay DL, Packer JM. The impact of service–learning on students' cultural competence. *Teaching and Learning in Nursing*. 2012;7(2):67–73. https://doi.org/10.1016/ j.teln.2011.11.002. [PMID: 20397475]
35. Classe-Cutrone R, McCann AL, Campbell PR, DeWald JP, Schneiderman ED. The Impact of Community Rotations on the Cultural competence of Dental Hygiene Students in the State of Texas. *The Journal of Dental Hygiene*. 2017;91(3):22-30. [PMID:29118068]
36. Creech C, Filter MH, Wehbe-Alamah H, McFarland MR, Andrews M, Pryor G. An Intervention to Improve Cultural competence in Graduate Nursing Education. *Nursing Education Perspectives.* 2017;38(6):333–336. https://doi.org/10.1097/01. NEP.0000000000000163. [PMID: 28574917].
37. de Diego-Lázaro B, Winn K, Restrepo MA. Cultural competence and Self-Efficacy After Study Abroad Experiences. *American Journal of Speech-Language Pathology*. 2020;29(4):1896–1909. https://doi.org/10.1044/2020_AJSLP-19-00101. [PMID:3266 3038].
38. Daugherty HN, Kearney RC. Measuring the impact of cultural competence training for dental hygiene students. *The Journal of Dental Hygiene*. 2017;91(5):48-54. [PMID:29118279].
39. Denton JM, Esparza S, Fike DS, Gonzalez J, Denton M. Improvements in Cultural competence Through Classroom and Local Cross-Cultural Service-Learning Activities. *Journal of Physical Therapy Education*. 2016;30(2):6-13. https://doi.org/10.1097/ 00001416-201630020-00004
40. Fioravanti MA, Puskar K, Knapp E, Kane I, Terhorst L, Mitchell AM, Hagle H, Dawn L. Creative Learning Through the Use of Simulation to Teach Nursing Students Screening, Brief Intervention, and Referral to Treatment for Alcohol and Other Drug Use in a Culturally Competent Manner. *Journal of Transcultural Nursing.* 2018;29(4):387–394. https://doi.org/10.1177/ 1043659 617727 832. [PMID: 28854846].
41. Glickman LG. Measuring the Cross-Cultural Adaptability of a Graduate Student Team from a Global Immersion Experience. *Journal of Cultural Diversity.* 2015;22:4. [PMID: 26817173].
42. Hayward LM. Promoting and Assessing Cultural competence, Professional Identity, and Advocacy in Doctor of Physical Therapy (DPT) Degree Students Within a Community of Practice. *Journal of Physical Therapy Education*. 2014;28(1):23-36. https://doi.org/10.1097/00001416-201410000-00005
43. Housman J, Meaney KS, Wilcox M, Cavazos A. The Impact of Service-Learning on Health Education Students' Cultural competence. *American Journal of Health Education.* 2012;43(5):269-278. https://doi.org/10.1080/19325037.2012.10599245

44. Hunter JL, Krantz S. Constructivism in Cultural competence Education. *Journal of Nursing Education*. 2010;49(4):207-14. https://doi.org/10.3928/01484834-20100115-06. [PMID: 20143755].
45. James L, Stiles A, Stephens C. Nursing Student Differences in Transcultural Self-Efficacy by Culture Curriculum: A Longitudinal Study. *Journal of Transcultural Nursing*. 2021;32(3):286–294. https://doi.org/10.1177/1043659620950422. [PMID: 32842884].
46. Jeffreys MR, Dogan, E. Evaluating the Influence of Cultural Competence Education on Students' Transcultural Self-Efficacy Perceptions. *Journal of Transcultural Nursing*. 2012;23(2):188–197. htpps://doi.org/10.1177/1043659611423836. [PMID:22052 092].
47. Knecht JG, Fontana JS, Fischer B, Spitz KR, Tetreault JN. An Investigation of the Development of Cultural competence in Baccalaureate Nursing Students: A Mixed-Methods Study. *Journal of Cultural Diversity*. 2019;26(3):89-95. https://doi.org/ 10. 29011/2577-2228.100044
48. Kohlbry WP. The Impact of International Service-Learning on Nursing Students' Cultural Competency. *Journal of Nursing Scholarship*. 2016;48(3):303–311. https://doi.org/10.1111/jnu.12209. [PMID: 27111382].
49. Levey JA. Teaching Online Graduate Nursing Students Cultural Diversity From an Ethnic and Nonethnic Perspective. *Journal of Transcultural Nursing*. 2019;31(2):202–208. https://doi.org/ 10.1177/1043659 619868760. [PMID: 31431123].
50. Long T. Influence of International Service Learning on Nursing Students' Self Efficacy towards Cultural competence. *Journal of Cultural Diversity*. 2016;23(1):28-33. https://doi.org/10.3928 /01484834-20140725-02. [PMID: 27188018].
51. Meaux JB, Saviers B, Traywick L. Effects of study abroad on cultural and interprofessional competencies. *Nurse Education Today*. 2021;103:104928. https://doi:10.1016/j.nedt.2021.104928. [PMID: 33965719].
52. Mihalic AP, Morrow JB, Long RB, Dobbie A.E. A validated cultural competence curriculum for US pediatric clerkships. *Patient Education and Counseling*. 2010;79(1):77–82. https://doi.org/ 10.1016/ j.pec.2009.07.029. [PMID: 19699600].
53. Musolino GM, Burkhalter ST, Crookston B, Ward RS, Harris RM, Chase-Cantarini S, Babitz M. Understanding and eliminating disparities in health care: development and assessment of cultural competence for interdisciplinary health professionals at The University of Utah---a 3-year investigation. *Journal of Physical Therapy Education.* 2010;24(1):25-36. https://doi.org/10.1097/ 00001416-201010000-00006
54. Muzumdar JM, Holiday-Goodman M, Curtis Black C, Powers M. Instructional Design and Assessment: Cultural competence Knowledge and Confidence After Classroom Activities. *American Journal of Pharmaceutical Education*. 2010;74(8):150. https://doi.org/10.5688/aj7408150
55. Ozkara San, E. Effect of the Diverse Standardized Patient Simulation (DSPS) Cultural competence. Education Strategy on Nursing Students' Transcultural Self-Efficacy Perceptions. *Journal of Transcultural Nursing*. 2019;30(3):291–302. https://doi.org/10.1177/1043659618817599. [PMID: 30539683].
56. Roller MC, Ballestas HC. Cultural Competency: Measuring the Sustainability Following an Immersion Program for Undergraduate Students. *The Journal of the New York State Nurses Association*. 2017; 25(1):25. https://doi.org/10.9730/ ojccnh.org/v5n1a6
57. Sales I, Jonkman L, Connor S, Hall D. A Comparison of Educational Interventions to Enhance Cultural Competency in Pharmacy Students. *American Journal of Pharmaceutical Education.* 2013;77(4):76. https://doi.org/10.5688/ajpe77476. [PMID: 23716744].
58. Vyas D, Caligiuri FJ. Reinforcing cultural competency concepts during introductory pharmacy practice experiences. *American Journal of Pharmaceutical Education*. 2010;74(7):129. https://doi.org/10.5688/aj7407129. [PMID: 21088735].
59. Young J, Jerolimov D, Ofner S. Promoting nursing students' transcultural self-efficacy to care for Burmese refugees using a set of educational strategies. *Nursing Forum.* 2021,56(2):460–466. https://doi.org/10.1111/nuf.12. [PMID: 33331028].
60. Park HS, Jang HJ, Jeong GH. Effects of a cultural nursing course to enhance the cultural competence of nursing students in Korea. *Journal of Education Evaluation Health Profession.* 2019;16:39. https://doi.org/ 10.3352/jeehp.2019.16.39
61. Fryer C, Edney S, van Kessel G. An interactive teaching module for increasing undergraduate physiotherapy students' cultural competence: A quantitative survey. *Physiotherapy Research Int.* 2021;26(1): e1880. https://doi.org/10.1002/pri.1880
62. Gower S, Duggan R, Jaya A R, Dantas JAR, Boldy D. One Year On: Cultural competence of Australian Nursing Students Following International Service-Learning. *Journal of Nursing Education*. 2019;58(1):17-26. https://doi.org/10.3928/01484834-20190103-04. [PMID: 30673088].
63. Olson R, Bidewell J, Dune T, Nkosi L. Developing cultural competence through self-reflection in interprofessional education: Findings from an Australian university. *Journal of Interprofessional Care*. 2016;30(3):347-354. https://doi.org/10.3109/ 13561820 .2016.1144583. [PMID: 27152539].

64. Peiying N, Goddard T, Gribble N, Pickard, C. International Placements Increase the Cultural Sensitivity and Competency of Professional Health Students: A Quantitative and Qualitative Study. *Journal of Physical Therapy Education*. 2012;26(1):61-68. https://doi.org/10.1097/00001416-201210000-00011
65. Chang LC, Guo JL, Lin HL. Cultural competence education for health professionals from pre-graduation to licensure delivered using Facebook: Twelve-month follow-up on a randomised control trial. *Nurse Education Today*. 2017;59:94-100. https://doi.org/10.1016/j.nedt.2017.09.005. [PMID: 28963921].
66. Lin CJ, Chang PR, Wang LH, Huang MC. Cultural competence course for nursing students in Taiwan: A longitudinal study. *Nurse Education Today*. 2015;35(12):1268–1274. http://dx.doi.org/ 10.1016/ j.nedt.2015.05.023. [PMID: 26094199].
67. Kula Y, Cohen O, Clempert N, Grinstein-Cohen O, Slobodin O. Educating nursing students for cultural competence in emergencies: a randomized controlled trial. *BMC Nursing*. 2021;20(184):1-12. https://doi.org/10.1186/s12912-021-00704-1. [PMID: 34587960].
68. Noble A, Nuszen E, Rom M, Noble LM. The effect of a cultural competence educational intervention for first-year nursing students in Israel. *Journal of Transcultural Nursing*. 2014;25(1):87–94. https://doi.org/10.1177/10436596 13503881. [PMID: 24060806]
69. Majda A, Zalewska-Puchała J, Bodys-Cupak I, Kurowska A, Barzykowski K. Evaluating the Effectiveness of Cultural Education Training: Cultural competence and Cultural Intelligence Development among Nursing Students. *International Journal Of Environment Research Public Health*. 2021;18(8):4002. https://doi.org/10.3390/ijerph18084002. [PMID: 33920334]
70. Campinha-Bacote J. The process of cultural competence in the delivery of healthcare services: a model of care. *Journal of Transcultural Nursing.* 2002;13(3):181–184. https://doi.org/10.1177/1045960201 3003003. [PMID: 12113146].
71. Campinha-Bacote J. The process of cultural competence in the delivery of healthcare services: A culturally competent model of care (4th Edition). Transcultural C. A. R. E., Cincinnati, OH; 2003.
72. Campinha-Bacote J. The process of cultural competence in the delivery of healthcare services: The journey continues (5th ed). Transcultural C. A. R. E. Associates, Cincinnati, OH; 2007.
73. Campinha-Bacote J. A Culturally Competent Model of Care for African Americans. *Urologic Nursing.* 2009;29(1):49-54. [PMID:19331277].
74. Campinha-Bacote J. The process of cultural competence in the delivery of healthcare services. Transcultural C.A.R.E Associates. Cincinnati, OH; 2013.
75. Campinha-Bacote J. Inventory for assessing the process of cultural competence among health care professionals – student version [Internet]. Cincinnati (OH): Transcultural C.A.R.E Associates; 2014.http://transculturalcare.net/iapcultural competence-sv/
76. Jeffreys MR. Teaching Cultural Competence in Nursing and Healthcare. Springer, New York; 2006.
77. Jeffreys M. Teaching cultural competence in nursing and health care (2nd Edition). Springer, New York; 2010a.
78. Jeffreys, M. R. Cultural competence education resource toolkit. New York, NY: Springer; 2010b.
79. Jeffreys, MR. Teaching Cultural Competence in Nursing and Health Care: Inquiry, Action, and Innovation, (3rd Edition). Springer Publishing Company; 2015.
80. Jeffreys MR. The cultural competence education resource toolkit (3rd Edition). Springer, New York; 2016b.
81. Jeffreys MR. Evidence-based updates and universal utility of Jeffreys's Cultural Competence and Confidence Framework for Nursing Education (and beyond) through time. *Annual Review of Nursing Research*. 2018;37(1):43-17. https://doi.org/10.1891/0739-6686.37.1.43. [PMID: 30692154].
82. Like RC. Clinical cultural competency questionnaire (CCCQ). New Brunswick (NJ): Center for Healthy Families and Cultural Diversity, Department of Family Medicine, UMDNJ-Robert Wood Johnson Medical School. 2001. https://www.umdnj.edu/ fmedweb/chfcd/aetna_foundation.html
83. Bernal H, Froman R. Influences on the Cultural Self-Efficacy of Community Health Nurses. *Journal of Transcultural Nursing.* 1993;4(2):24-31. https://doi.org/10.1177%2F1043 65969300400205. [PMID: 8507433].
84. Bernal H, Froman R. The confidence of community health nurses in caring for ethnically diverse populations. *Image Journal of Nursing Scholarship.* 1987;19(4):201-3. https://dx.doi.org /10.1111/j.1547-5069.1987.tb00008.x. [PMID: 3692524].
85. Chang LC. The Longitudinal Effects of a Training Program of Cultural competence for Health Professionals: Survey of Cultural competence, the Development and Evaluation of the Educational Modules on Social Networking Service. Ministry of Science and Technology. ROC, Taipei;2011.
86. Hammer MR, Bennett MJ, Wiseman R. Measuring intercultural sensitivity: The intercultural development inventory. *International Journal of Intercultural Relations*. 2003;27(4):421-443. https://doi.org/10.1016/S0147-1767(03)00032-4
87. Hammer MR. The Intercultural Development Inventory. In Moodian MA (ed). Contemporary leadership and intercultural competence. Thousand Oaks, CA: Sage;2009:203–217.

88. Hammer MR. Additional cross-cultural validity testing of the Intercultural Development Inventory. *International Journal of Intercultural Relations.* 2011;35:474–487. https://doi.org/10.1016/j.ijintrel.2011.02.014
89. Schim S, Doorenbos A, Miller J, Benkert R. Development of a Cultural competence Assessment Instrument. *Journal of Nursing Measurement*. 2003;11(1):29-40. https://doi.org/10.1891 /jnum.11.1.29.52062. [PMID: 15132010].
90. Doorenbos AZ, Schim SM, Benkert R, Borse NN. Psychometric evaluation of the cultural competence assessment instrument among healthcare providers. *Nursing Research*. 2005;54(5):324-331. https://doi.org/10.1097/00006199-200509000-00006. [PMID: 16224318].
91. Chae D, Lee C. Development and Psychometric Evaluation of the Korean Version of the Cultural competence Scale for Clinical Nurses. *Asian Nursing Research*. 2014;8(4):305-312. https://doi.org/ 10.1016/j.anr.2014.06.004. [PMID: 25529915].
92. Ang S, Van Dyne L, Koh C, Ng K Y, Templer KJ, Tay C, Chandrasekar, NA. Cultural intelligence: Its measurement and effects on cultural judgment and decision making, cultural adaptation and task performance. *Management and Organization Review.* 2007;3(3):335–371. https://doi.org /10.1111/ j.1740-8784.2007.00082.x
93. Barzykowski K, Majda A, Przył˛ecki P, Szkup, M. The cross-cultural competence inventory: Validity and psychometric properties of the Polish adaptation. *PLoS ONE.* 2019a;14(3):e0212730. https:// doi.org/10.1371/journal.pone.0212730. [PMID: 30845146].
94. Barzykowski K, Majda A, Szkup M, Przył˛ecki P. The Polish version of the Cultural Intelligence Scale: Assessment of its reliability and validity among healthcare professionals and medical faculty students. *PLoS ONE.* 2019b;14 (11):e0225240. https://doi.org /10.1371/journal.pone.0225240. [PMID: 31765412].
95. de Diego-Lázaro B. A study abroad to Nicaragua: Measuring cultural competence in speech and language pathology students. *Perspectives of the ASHA Special Interest Groups.* 2018;3(17):38–48. https://doi.org/10.1044/persp3.SIG17.38
96. Kelley C, Meyers J. CCAI ™ (Cross-Cultural Adaptability Inventory) Manual. VA: Vangent, Inc; 1995.
97. Mareno N, Hart P, VanBrackle L. Psychometric validation of the revised clinical cultural competency questionnaire. *Journal of Nursing Measurement*. 2013;21(3):426–436. https://doi:10.1891/1061-3749.21.3.426. [PMID: 24620515].
98. Gamst G, Dana R, Der-Karabetian A, Aragon M, Arellano L, Morrow G, Martenson L. Cultural Competency Revised: The California Brief Multicultural competence Scale. *Measurement and Evaluation in Counseling and Development*. 2004;37(3):163-183. https://doi.org/10.1080/07481756. 2004.11909758.
99. Assemi M, Cullander C, Hudmon KS. Cultural competence in pharmaceutical care delivery: a training template for a one-day pharmacy student elective course. *Annals Pharmacotherapy*. 2004;38:78-85. https://doi.org/10.1345/aph.1D402. [PMID: 19777096].
100. Loftin C, Hartin V, Branson M, Reyes H. Measures of Cultural competence in Nurses: An Integrative Review. *The Scientific World Journal.* 2013;(289101):1-10. https://doi.org/ 10.1155/2013/289101. [PMID: 23818818].
101. Sullivan GM, Getting off the gold standard: randomized controlled trials and education research. *Journal of Graduate Medical Education.* 2011;3(3):285-9. https://doi:10.4300/JGME-D-11-00147.1. [PMID: 22942950].
102. Norman G. Is experimental research passé. *Advanced Health Science Education Theory Practice*. 2010;15(3):297–301. https://doi:10.1007/s10459-010-9243-6. [PMID: 20821259].
103. Jeffreys, M. R. Development and psychometric evaluation of the Transcultural Self-Efficacy Tool: A synthesis of findings. *Journal of Transcultural Nursing*. 2000;11(2):127-136. https://doi: 10.1177/104365960001100207. [PMID: 11982045].
104. Society of Teachers of Family Medicine. Cultural and Linguistic Competence Pocket Guide; 2008. [cited 2022 Aug 03]. https://www.fmdrl.org.
105. Echeverri M, Brookover C, Kennedy K. Factor analysis of a modified version of the California brief multicultural competence scale with minority pharmacy students. *Advances in Health Science Education*. 2011;16(5):609–626. https://doi.org/10.1007 /s10459-011-9280-9 101. [PMID: 21290177].
106. Sealey L, Burnett M, Johnson G. Cultural competence of baccalaureate nursing faculty: are we up to the task? *Journal of Cultural Diversity.* 2006;13(3):131-140. [PMID:16989249].
107. Campinha-Bacote, J. The Process of Cultural Competence in the Delivery of Healthcare Services: A Culturally Competent Model of Care, 3rd ed. Cincinnati, Ohio: Transcultural C.A.R.E. Associates,1998.
108. Westberg SM, Bumgardner MA, Lind PR. Enhancing cultural competency in a college of pharmacy curriculum. *American Journal of Pharmacy Education*. 2005;69(5):82. https://doi.org/10.5688/aj690582
109. Dogra N. The development and evaluation of a program to teach cultural diversity to medical undergraduate students. *Medical Education*. 2001;35(3):232-241. https://doi.org/10.1016/j.iccn.2020. 102892. [PMID: 11260446].

Appendix 1
Details of the search strategy employed to identify studies of cultural competency training that have been objectively assessed for efficacy

Search terms:
('cultur*' or 'cultural competen*' 'cultural competen* training' or 'cultural competen* teaching' or 'cultural competen* intervention')
AND
('nurs*' or 'health' or 'radiograph*' or 'physio*' or 'podiat*' or 'occupational therap*' or 'physical therap*' or 'speech patho*' or 'optometr*' or 'pharmac*' or 'speech path*' or 'medical imag*' or 'medical rad*' or 'dental' or dentist* or 'psychology' or 'medical' or 'social work' or 'health care' or 'healthcare')
AND
('student*' or 'undergraduate' or 'postgraduate' or 'higher education' or 'tertiary education' or 'universit*' or 'colleg*')
AND
('pre-intervention' or 'post-intervention' or 'pretest' or 'posttest' or 'pre-test' or 'post-test' or 'assess*' or 'assess* tool' or 'survey*' or 'questionnaire*')
Limiters - Published Date: 01012010–31122021; Peer Reviewed; Language: English

Appendix 2:
Assessment of quality of quantitative studies using the Evaluation Tool for Quantitative Research[28]

Bibliographic Details	Is the study evaluative overview; purpose, key findings and evaluative summary included?	Is the study, setting and sample Specified?	Is ethics process specified?	Is the group comparability and outcome measurement specified where applicable?	Are the policy and practice implications specified?
Alrqiq et al. (2015)	Yes	Yes	Yes	N/A	Yes
Amerson (2010)	Yes	Yes	Yes	N/A	Yes
Boggis (2012)	Yes	Yes	Yes	Yes	Yes
Chen et al. (2012)	Yes	Yes	Yes	N/A	Yes
Classe-Cutrone et al. (2017)	Yes	Yes	Yes	N/A	Yes
Creech et al. (2017)	Yes	Yes	Yes	N/A	Yes
Daugherty, Kearney (2017)	Yes	Yes	Yes	N/A	Yes
de Diego-Lázaro et al. (2020)	Yes	Yes	Yes	N/A	Yes
Denton et al. (2016)	Yes	Yes	Yes	N/A	Yes
Fioravanti et al. (2018)	Yes	Yes	Yes	N/A	Yes
Fryer et al. (2021)	Yes	Yes	Yes	N/A	Yes
Glickman (2015)	Yes	Yes	Yes	Yes	Yes
Gower et al. (2019)	Yes	Yes	Yes	N/A	Yes
Hunter, Krantz (2010)	Yes	Yes	Yes	N/A	Yes
James et al. (2021)	Yes	Yes	Yes	N/A	Yes
Jeffreys, Dogan (2012)	Yes	Yes	Yes	N/A	Yes
Kohlbry (2016)	Yes	Yes	Yes	N/A	Yes
Kula et al. (2021)	Yes	Yes	Yes	Yes	Yes
Levey (2019)	Yes	Yes	Yes	N/A	Yes
Lin et al. (2015)	Yes	Yes	Yes	N/A	Yes
Long (2016)	Yes	Yes	Yes	N/A	Yes

Majda et al. (2021)	Yes	Yes	Yes	N/A	Yes
Mihalic et al. (2010)	Yes	Yes	Yes	N/A	Yes
Musolino et al. (2010)	Yes	Yes	Yes	N/A	Yes
Muzumdar et al. (2010)	Yes	Yes	Yes	N/A	Yes
Olson et al. (2016)	Yes	Yes	Yes	N/A	Yes
Ozkara San (2019)	Yes	Yes	Yes	N/A	Yes
Park et al. (2019)	Yes	Yes	Yes	N/A	Yes
Roller, Ballestas (2017)	Yes	Yes	Yes	N/A	Yes
Sales et al. (2013)	Yes	Yes	Yes	N/A	Yes
Singleton (2017)	Yes	Yes	Yes	N/A	Yes
Vyas, Caligiuri (2010)	Yes	Yes	Yes	N/A	Yes
Young et al. (2021)	Yes	Yes	Yes	N/A	Yes

Appendix 3
Risk of bias in Mixed Method studies[29]

Bibliographic Details	Is there an adequate rationale for using a mixed-methods design to address the research question?	Are the different components of the study effectively integrated to answer the research question?	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	Total Score %
Byrne (2020)	Yes	Yes	Yes	Yes	Yes	100
Chang (2017)	Yes	Yes	Yes	Yes	Yes	100
Hayward (2014)	Yes	Yes	Yes	Yes	Yes	100
Housman et al. (2012)	Yes	Yes	Yes	Yes	Yes	100
Knecht et al. (2019)	Yes	Yes	Yes	Yes	Yes	100
Meaux et al. (2021)	Yes	Yes	Yes	Yes	Yes	100
Noble et al. (2014)	Yes	Yes	Yes	Yes	Yes	100
Peiying et al. (2012)	Yes	Yes	Yes	Yes	Yes	100