

Objective Structural Clinical Examinations can be Used to Assess Clinical Nursing Cultural Competence Abilities.

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Research article

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Abstract

Background: Culture is the adhesive that binds people's lives. However, there is a lack of an objective and useful tool for assessing cultural competence and practice. The purpose of this study were to assess the learning efficacy of nurses after completing the Cultural Competence Cultivation Program using an Objective Structured Clinical Examination (OSCE).

Methods: A quasi-experimental research design was used to evaluate nurses working at a medical center in Taiwan. The nurses were randomly allocated into an experimental group (N = 47), which underwent the Cultural Competence Cultivation Program, and a control group (N = 50), which did not partake in an educational program. After the intervention, the nurses' learning efficacy was assessed using an OSCE. The research data were statistically analyzed using SPSS 22.0 software for Windows.

Results: The average score of the experimental group was significantly higher in the "communication ability and skill" category. Furthermore, the OSCE scores, Standardized Patient Survey (SPS) scores and overall SPS scores were significantly and positively correlated.

Conclusion: The findings of this study can serve as a reference for the design of future clinical education programs.

Background

Culture is the adhesive that binds people's lives. Therefore, its impact on health should not be overlooked [1]. Nurses must be able to identify cultural discrepancies and apply different communication skills to provide patient-centered nursing care to patients from different backgrounds. Hospitals with culturally sensitive nurses and culturally friendly care environments have lower health inequalities and health disparities [2, 3, 5]. Cultural competence is fostered through learning and thus a fundamental strategy for nurses to foster cultural competence is participation in educational programs [6]. The cultivation of cultural competence is an interactive process involving different cultural scenarios. Therefore, cultural competence cultivation programs should contain multiple strategies [7]. Jeffreys developed an educational program that involves different teaching strategies, such as narration, literature review and discussion, film appreciation, and role-playing, to help clinical nurses learn cross-cultural nursing concepts and assess their cultural competence [8]. Numerous studies have reported that course evaluation, performance analysis, and continuous course adjustment must be taken into account when designing an educational course to cultivate the cultural competence of nurses and accumulate empirical data on cultural competence [3, 9].

Miller asserted that a bottom-up approach for assessing professional competence follows the assessment of knowledge, know-how, show-how, and do [10]. The Objective Structured Clinical Examination (OSCE) is a show-how approach for assessing the professional execution of learners' skills [11]. In other words, it is a competence-oriented assessment of clinical performance. As a single, consolidated test the OSCE can be used to objectively, fairly, and safely assess student knowledge, skills,

and attitudes in a simulated environment, allowing learners to confidently prepare for future clinical encounters [9, 12]. It uses a reliable and valid categorical and structured checklist and standardized patients (SPs) to test learners on specific scenarios and standard operating procedures in controlled situations [9]. Assessment criteria include interpersonal communication, clinical problem-solving competence, health education, evaluation, and decision-making abilities [13, 14, 15]. The OSCE is fast becoming the primary tool for assessing clinical competence [13, 14]. Moreover, the OSCE is not administered using actual patients, which takes into account patient safety. By adopting the objective and structured characteristics of a SP and using well-designed clinical scenarios, the OSCE is more capable of assessing learners' clinical competence than previous traditional written tests. The test also allows for reflection and self-learning. Therefore, the OSCE more effectively enhances learners' learning efficacy than traditional tests [16]. Miller asserted that the SP-based OSCE is the best teaching tool for assessing "proper practices (performance)" [10]. The OSCE is already used in various simulated learning scenarios, including operational and communication skills in medical and nursing education [17]. Bani-Issa et al. [18] administered the OSCE to students of a physical assessment program to evaluate their physical assessment competence and the students expressed that the OSCE promoted in-depth learning and prepared them for the real world. Solà-Pola et al. [19] invited nursing students to partake in qualitative interviews. The research subjects experienced the OSCE by engaging in educational activities, and the researchers were able to obtain desired clinical care performance data.

Ledford et al. [20] developed an innovative teaching method based on adult learning theory and social cognitive theory. The researchers combined the OSCE with the religious affiliations and spiritual issues of the respondents. The results indicated that the OSCE helps medical professionals foster the skills necessary to communicate with patients in challenging situations. Developers of multicultural education programs can design different courses, dialogues, and scenarios by applying the concepts of the OSCE, including (1) providing standardized and diversified patients; (2) citing medical histories, conducting physical examinations, and providing nursing care; (3) presenting cultural discrepancies and focal cultural learning points as open questions; and (4) referencing anatomical systems, nursing care items, and learning objectives. The verbal and nonverbal expressions of the patient's culture, such as word use, intonations, movements, gestures, and facial expressions, can be examined to elucidate and test the appropriateness of caregivers' responses in different cultural contexts [21]. The purpose of this learning process is to enhance learners' cultural observation, cultural sensitivity, cultural care performance, and reflection ability, thereby ensuring the provision of culturally appropriate nursing care and preparing students mentally and professionally to care for multicultural patients [22]. In recent years, the focus of medical education has shifted toward the assessment of clinical performance. However, evaluating cultural competence through a written examination is exceptionally challenging because an objective and useful tool for assessing cultural competence is currently lacking. Therefore, we aspired to use the OSCE to assess the learning efficacy of nurses after completing a cultural competence cultivation program.

Methods

Design and participants

We adopted a quasi-experimental research design to examine nurses working at a medical center in Taiwan. The nurses were randomly allocated into an experimental group (N = 47), which participated in the Cultural Competence Cultivation Program, and a control group (N = 50), which did not partake in an educational program. For inclusion, participants needed to be licensed nurses (1) who graduated from an approved nursing program and (2) who have served as a clinical nurse for at least one year. Nurses diagnosed with cancer or depression were excluded from this study. G*Power 3.1 software was used to calculate the required sample size. Two statistical tests were performed using an analysis of variance (repeated measures, between factors) with parameters $\alpha = .05$ and power = 0.8. We adopted Cohen's rule of thumb for an effect size of 0.25 and a moderate autocorrelation value of 0.5 at 50% time interaction. The minimum sample size was 82 samples. This value was adjusted to 100 to allow for a 23% loss rate (N = 23). A total of 97 respondents completed the formal intervention and the two-month post-intervention OSCE (47 respondents in the experimental group, and 50 respondents in the control group). The loss rate was 3%.

Basic attributes: These attributes include age, gender, marital status, highest level of education, nursing experience, nursing competence and rank, place of work, experience caring for foreigners, participation in multicultural programs, experience studying abroad, experience interacting with foreigners, and language proficiency.

Measures

Cultural Competence Cultivation Program

The Cultural Competence Cultivation Program for nurses is based on social learning theory and focuses on cultural awareness, cultural knowledge, cultural willingness, cultural skills, and cultural circumstances [24, 25]. The program consisted of four units. A new unit was taught each week and each unit lasted three hours, for a total intervention time of 12 hours. Three experts in the cultivation of cultural competence were invited to review and provide feedback on the cultural aspects of the program. The program was also adjusted based on feedback provided by the participants. The program was delivered by two lecturers with postgraduate degrees in nursing practice and trained in multicultural education.

Objective Structured Clinical Examination (OSCE)

Previous studies have reported that an education and assessment tool that combines SPS and OSCE can effectively evaluate the clinical performance of learners [26]. The OSCE was designed based on Khattab and Rawlins [27]. The OSCE comprised the Multicultural Objective Structured Examination (MOSE) to assess nurses and the Standardized Patient Survey (SPS) to assess standardized patients.

MOSE: The evaluation criteria of the nurses include (1) doctor/patient communication, problem assessment, and problem-solving; and (2) nursing instruction for medications (communication ability and skill). The test comprises ten items. The items are scored on a three-point scoring system, where 2 denotes "accomplished," 1 denotes "partially accomplished," and 0 denotes "unaccomplished." The

scores of the ten items are summed. A high score represents a high cultural competence in clinical care. The Cronbach's α coefficient of the test is .70.

SPS: The contents of this survey include empathy and verbal/nonverbal communication skills. A score is allocated based on the perceived interactions between the SP and the respondent. Specifically, 2 is allocated when the "correct" field in the right column is checked, 1 for "partially correct," and 0 for "not performed." The fields represent the respondents' perceived performance. The survey comprises five items and the total score therefore ranges between 0 and 10. A high score represents a high nurse-patient communication performance and cultural competence. The Cronbach's α coefficient of the survey is .62.

All SPs who participated in the OSCE completed a general SP program and a performance and teacher training program (eight hours) and an OSCE rehearsal (three hours). Before the lesson, the researcher and three SPs discussed their roles. Before commencement, the examiner and the SPs discussed the script and rehearsed the scenario. The OSCE was administered two months after the completion of the education program. The two groups of respondents were told by telephone that they could take the test at the Clinical Competence Center. The respondents entered the examination hall in order of registration, regardless of group. The examiner and SPs were unable to identify the respondent groups, which ensured that the research results remained unbiased.

The validity of the OSCE has been assessed by experts with over ten years of medical and clinical education experience based on the content validity index (CVI). A four-point scoring system was adopted as the assessment standard. Expert opinions were consolidated and applied and referenced to adjust the research tools [28]. The item-CVI and scale-CVI coefficients were 1.00 for the MOSE and SPS.

Data collection.

The study was conducted from August 2017 to July 2018. The procedures of the OSCE were based on Boursicot and Roberts [29].

Designing and editing lesson plans: Several meaningful real-world examples were used to design the scripts for the program. Lessons were divided into the following parts: (1) student guidelines, which included patient background data, clear instructions, and test time; (2) examiner guidelines, which included case descriptions, patient summaries, health education tools and models, and scoring standards; (3) SP (Standardized Patient) guidelines, which included basic SP information, script summaries, and dialogues; and (4) score sheet, which included the assessment items, content, and scoring standards.

Examiner consensus: A teaching video was produced and jointly evaluated by the examiners. The Cronbach's α coefficient was 0.85, indicating a fair internal consistency.

OSCE operating procedures: The OSCE was administered in the Clinical Competence Center of the research hospital. The examination was conducted in a simulated clinical environment that could be unidirectionally monitored and recorded. The script and notes were adhered to the door. The scenario

involved a 23-year-old Vietnamese caregiver who has worked in Taiwan for two months. Her job was to care for a 75-year old male stroke patient with a urinary infection. The patient was scheduled for discharge that day. Student guidelines included background information, test topics, and test time. The scene involves a nurse issuing post-discharge instructions for the medication given to the Vietnamese caregiver for the patient. During the examination, the examiner completed the MOSE based on the examiner guidelines. After the examination, the SPs completed the SPS based on their perceived subject performance.

Data analysis

SPSS 22.0 for Windows was used for data processing and analysis. A descriptive statistics approach was used to analyze the demographics. The outcomes were presented as percentages, mean values, and standard deviation values. Inter-group differences were compared using independent *t*-tests. A Spearman's correlation analysis was conducted to determine the correlations between the assessment tools in the OSCE. $P < .05$ was adopted as the measure of statistical significance.

Ethical considerations

This study was approved by the Institutional Review Board of the research hospital (Approval No. XXX). Before commencing this study, the participants were fully informed of the research objectives and data collection methods. They were also informed that they could withdraw from the study at any time if they felt uncomfortable, or they no longer wanted to participate in this study. The collected data were archived anonymously. The research only commenced once the participants agreed to participate in this study and signed an informed consent form.

Results

Basic attributes of the research subjects

The average age of the participants was 36.49 (± 10.14) years. The average age of the experimental group participants was 35.98 (± 9.99) years. Together, the participants had an average of 14.78 (± 10.31) years of service. The participants in the experimental group had an average of 14.40 (± 10.17) years of service. Sixty percent of all participants were unmarried, including 66% of the experimental group. For level of education, 68% of the participants graduated from university. For professional rank, 36% of the participants attained a rank of N3 or higher. For place of work, 37.0% of the participants served in internal medicine. Statistical analysis indicated no significant statistical difference between the two groups of subjects ($p > .05$), suggesting homogeneity within the pre-intervention attributes of the two groups.

OSCE intergroup effect analysis

Intergroup differential analysis was conducted on the OSCE scores of the two groups. In the MOSE, the average score of the experimental group was 1.83 ($SD = .14$), and that of the control group was 1.78 ($SD = .18$). Although the average score of the experimental group was slightly higher than that of the control

group, the difference was not statistically significant ($p = .08$). For doctor/patient communication, problem assessment, and problem-solving, the average score of the experimental group was 1.91 ($SD = .13$), and that of the control group was 1.90 ($SD = .13$). However, the difference failed to achieve statistical significance ($p = .086$). For nursing instructions on medication (communication ability and skill), the average score of the experimental group was 1.72 ($SD = .24$), and that of the control group was 1.59 ($SD = .30$). The average score of the experimental group was slightly but significantly higher than that of the control group ($p = .01$). The average score of the experimental group for the “explaining the precautions for taking medication” item was also slightly higher than that of the control group, and the difference achieved statistical significance ($p < .001$; Table 1).

Differential analysis of SPS scores and correlations between the various assessment tools of the OSCE

The intergroup chi-squared test comparing the experimental group and the control group did not show any significant statistical differences. Regarding the correlations between the various assessment tools of the OSCE score, the overall MOSE score and the SPS assessment score had a significant and positive correlation ($r = .34, p < .01$), the overall MOSE score and the overall SPS performance score had a significant and positive correlation ($r = .36, p < .01$), and the SPS assessment score and the SPS performance score had a significant and positive correlation ($r = .95, p < .01$) (See table 2).

Discussion

In this study, we used the OSCE to assess the effectiveness of a cultural competence cultivation program for nurses. After participating in the Cultural Competence Cultivation Program, there was a statistically significant difference in the MOSE score for “nursing instructions on medication (communication ability and skill)”, with the experimental group obtaining a higher score than the control group. This finding is similar to the results of several previous studies.

Alinie et al. [30] examined differences in the practical abilities of nurses after they had received situational simulation training. In their study, the experimental group underwent situational training while the control group received traditional classroom lessons and clinical training. The OSCE assessment for learning efficacy indicated that the students who received situational simulation training significantly outperformed those in the control group. Moreover, additional previous studies have reported that the OSCE provides a controlled environment to train instructors in achieving a common teaching goal. Compared to conventional assessment methods, the OSCE is more capable of enhancing learners’ learning efficacy because it provides intricately designed clinical situations that enable examiners to observe learners’ nursing performance on SPs and allow learners to reflect and learn from their experiences [16, 31]. The outcomes of the aforementioned studies coincide with the findings of this study, particularly those pertaining to the performance of “nursing instructions on medication.” However, the findings of this study were different from those of Doyle et al., who designed a nursing education program for care of patients with communication difficulties [32]. In their study, the experimental group underwent communication training, while the control group did not receive any intervention. The OSCE

was used in a pretest and a posttest. The findings indicated that communication, self-efficacy, and OSCE performance of the experimental group and control group improved. However, the level of improvement between the two groups had no significant difference. Doyle et al. attributed their findings to both groups receiving the OSCE before the intervention and concluded that the OSCE effectively improved communication self-efficacy and OSCE performance.

The total MOSE score and the “doctor/patient communication, problem assessment, and problem-solving” score of the experimental group were higher than those of the control group. However, the scores of the two groups failed to achieve significant statistical differences ($p > .05$). Most of the students expressed that the assessment method of OSCE was stressful. This method could have produced biases in respondents’ performance. The Cronbach’s α coefficient of the SPS was .62. Assessment of communication skills, single-station OSCE, and low item count may have influenced internal consistency and reliability. A systematic review of the validity of the OSCE scores indicated that the covariates with significant Cronbach’s α were (1) OSCE content (clinical scale higher than communication scale), (2) the number of examiners (two higher than one), and (3) scale type (checklist higher than Likert scale) [33]. During the OSCE, respondents entered the examination hall in order of registration regardless of their group. The examiner and SPs were unable to identify the respondent groups, which ensured that the research results remained unbiased [34].

The examiners of this study jointly assessed an educational video. Cronbach’s α coefficient was adopted as an indicator of homogeneity. Results indicated a Cronbach’s α coefficient of 0.85, which was within the acceptable range. A coefficient lower than 0.7 denotes that the homogeneity of a portion of the items is questionable, and modifications are required. A coefficient higher than 0.9 denotes that the items have excellent internal consistency or homogeneity [29]. Our findings indicated that the total OSCE score was significantly and positively correlated with the SPS assessment score and the total SPS score. These results were different from those proposed by Schwartzman et al. [35]. Schwartzman et al. used the OSCE to assess the communication skills of pharmacy students. Examiners and SPs were invited to conduct evaluations. Their results showed no significant correlation between examiner assessments and SP assessments, which could be attributed to the different roles of the SPs and examiners. SPs are the direct subject of communication in the examination, while examiners are third-party observers. Therefore, SPs and examiners may perceive learners’ communication skills differently. A review of the OSCE items and examiner reliability and validity indicated that test environment and line arrangement influence the reliability and validity of the OSCE. These factors were not addressed in this study, which is a limitation. In addition, the OSCE is resource-intensive. The high cost of conducting OSCEs has limited its application. We recommend that future research focus on the external validity of different OSCEs.

Conclusion

In this study, we designed a method for assessing the performance of education programs. The proposed method was used to effectively assess the cultural competence of clinical nurses. The findings of this

study serve as a reference for health care providers in the process of designing cultural competence-related education programs to improve clinical nursing care quality.

Abbreviations

OSCE: Objective Structured Clinical Examination

SPS: Standardized Patient Survey

SPs: standardized patients

MOSE: Multicultural Objective Structured Examination

CVI: Content Validity Index

SP: Standardized Patient

Declarations

Ethics approval and consent to participate:

This study was approved by the MacKay Memorial Hospital Institutional Review Board of the research hospital (Approval No. 17MMHIS096e).

Consent for publication: Not applicable.

Availability of data and materials:

The datasets used and analysed during the current study are available from the corresponding authors on reasonable request.

Competing interests

The authors declare no conflict of interest.

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Authors' contributions:

Lee Yu-Hsia, designed the teaching materials, collected and analyzed the data, and evaluated the learning outcome of this intervention.

Lin Shu-Chuan, designed the teaching materials,

Wang Pao-Yu, collected and evaluated the learning outcome of this intervention.

Lin Mei-Hsiang, designed the teaching materials and evaluated the learning outcome of this intervention, critically revised and approved the final manuscript.

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Tables

Table 1
Intergroup differential analysis of the OSCE scores of the two groups

Variables	Experimental group		Control group		<i>t</i>	<i>p</i>
	Mean	SD	Mean	SD		
Doctor/patient communication, problem assessment, and problem-solving	1.91	.13	1.90	.13	.17	.86
ÿShows respect for foreign caregivers (look and tone) and a sincere attitude	1.96	.20	1.96	.19	-.06	.95
ÿShows empathy (listens attentively without interrupting the speaker)	1.91	.28	1.88	.32	.56	.57
ÿUses language that the patient understands, speaks at a suitable speed, and uses appropriate body language	1.83	.38	1.88	.32	-.69	.48
ÿSolicits a response or validation (responds appropriately to the patient's queries and verifies that the patient understands)	1.85	.36	1.84	.37	.15	.88
ÿAble to appease foreign caregivers	1.91	.35	1.90	.303	.22	.82
ÿAble to understand the foreign caregiver's queries, identify the problem, and provide a valid explanation	2.00	.00	1.98	.141	.96	.33
Nursing instructions on medication (communication ability and skill)	1.72	.24	1.59	.30	2.47	.01
ÿAble to explain the precautions for taking medication	1.57	.50	1.16	.37	4.61	<.001
ÿAble to understand the foreign caregiver's queries, identify the problem, and provide a valid explanation	1.72	.45	1.70	.46	.25	.80
ÿAble to confirm that the foreign caregiver understands administration procedures	1.85	.36	1.84	.37	.14	.88
ÿAble to employ guided or alternative methods of explanation (e.g., pictures, images, actions, talking speed)	1.77	.42	1.66	.519	1.09	.27
Total MOSE score	1.83	.14	1.78	.18	1.72	.08
MOSE, Multicultural Objective Structured Examination; OSCE, Objective Structured Clinical Examination.						

Table 2
Correlations between the various assessment
tools of the OSCE

variables	1	2	3
1. OSCE scores	1		
2. SPS assessment score	.34**	1	
3. overall MOSE score	.36**	.95**	1
** p <.01			