



# **A comparative study to evaluate the effectiveness of Objective Structured Clinical Examination (OSCE) versus Traditional Clinical Examination (TCE) on Clinical knowledge and Clinical skill competence regarding Tracheostomy Care among Undergraduate Nursing students in selected Nursing Institutions at Bhopal, M.P.**

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## **ABSTRACT**

### **STATEMENT OF THE PROBLEM**

A comparative study to evaluate the effectiveness of Objective Structured Clinical Examination (OSCE) versus Traditional Clinical Examination (TCE) on Clinical knowledge and Clinical skill competence regarding Tracheostomy Care among Undergraduate Nursing students in selected Nursing Institutions at Bhopal, M.P.

### **METHOD AND MATERIALS**

A quantitative evaluative approach using True experimental design consisting of post-test only control group design was conducted at Mar Baselios and Kasturba College of Nursing Bhopal, M.P. 220 Undergraduate Nursing students were selected by simple random sampling a pilot study was conducted. A Self-Structured Knowledge Questionnaire, Observational checklist to assess clinical skill performance by OSCE method, Criteria based observational check list for TCE for Tracheostomy Care procedure and Structured Opinionnaire (5-point Likert Scale-satisfaction scale) to get the opinion about OSCE for learning Tracheostomy care from experimental students.

The findings suggested that there was a significant statistical difference in the level of knowledge and skill among undergraduate nursing students between OSCE and TCE method regarding tracheostomy care. There was no significant association between clinical competency and demographic variables in the experimental group. There was a significant association between the level of clinical competence and demographic variables in the control group with the year of study, age, among subjects in experimental group. There was a significant association between the clinical knowledge and year of study in the control group IV-year students had more clinical knowledge

score than III-year students.

There was a moderate positive correlation between clinical knowledge score and clinical skill competence score in experimental group. There was a poor positive correlation between clinical knowledge score and clinical skill competence score in control group. 87 (79-09 %) of them had 91%-100% level of satisfaction towards learning Tracheostomy care through OSCE.

**KEYWORDS :** Effectiveness, OSCE, TCE, Tracheostomy Care, Undergraduate Nursing students.

## **Effectiveness of Objective Structured Clinical Examination (OSCE) versus Traditional Clinical Examination (TCE) on Clinical knowledge and Clinical skill competence regarding Tracheostomy Care among Undergraduate Nursing students**

Clinical nursing is considered as the heart of a nurse's professional practice and therefore the evaluation/assessment of nursing students' clinical competence is critical to their education and it is an essential requirement of health professional education. Nurses are the largest group of health care professionals and they deal directly with the lives of human beings. Nursing institutions teach students to perform the necessary skills and test those skills with competency assessments. Using the right method of evaluation plays a significant role in getting the appropriate result and making the right judgment.

Process of evaluation helps the learner to know what they should learn. It also provides information about their progress and recognizes the areas of learning difficulties. Clinical evaluation is a critical element in the professional education program. The issues affecting nursing education today are increasingly complex and dynamic. Clinical teaching is one of the most important academic and health professionals' components and should be given utmost consideration to cope with the recent requirements of nursing education. Proper selection of assessment methods is needed to improve students' performance while faulty assessment methods can lead to wrong decisions which might harm the future activities of the students. Therefore, assessment techniques seem to have an impact on learning strategies and to influence the performance of students.

### **Statement of problem**

A comparative study to evaluate the effectiveness of Objective Structured Clinical Examination (OSCE) versus Traditional Clinical Examination (TCE) on Clinical knowledge and Clinical skill competence regarding Tracheostomy Care among Undergraduate Nursing students in selected Nursing institutions at Bhopal, M.P

### **Objectives**

1. To assess the Post-test level of clinical knowledge and clinical skill competence of undergraduate Nursing students in experimental group.
2. To assess the Post-test level of clinical knowledge and clinical skill competence of undergraduate Nursing students in control group.
3. To evaluate the effectiveness of OSCE vs TCE in terms of Clinical knowledge and Clinical skill competence regarding tracheostomy care among Undergraduate Nursing students.
4. To find out the association between the post-test level of clinical knowledge, clinical skill competence regarding tracheostomy care and selected demographic variables in the experimental group, control group.

5. To find out the relationship between clinical knowledge and clinical skill competence regarding tracheostomy care among the Undergraduate Nursing students.

6. To identify the opinion of students regarding OSCE for tracheostomy care among the Undergraduate Nursing students.

### Hypothesis

**All hypotheses were tested at the significance level of 0.05.**

**H1:** There will be a significant difference in the post-test level of clinical knowledge among undergraduate Nursing students between the experimental group and the control group.

**H2:** There will be a significant difference in the post-test level of clinical skill performance among undergraduate Nursing students between the experimental group and the control group.

**H3:** There will be a significant association between the selected demographic variables and the post-test level of clinical knowledge, clinical skill competence in experimental group, control group.

**H4:** There will be a statistically significant relationship between post – test clinical knowledge and post – test clinical skill competence among under graduate nursing students in experimental group, control group

### Operational definitions

**Evaluate:** In this study, it refers to the method of estimating and interpreting the effectiveness of OSCE as measured by the post-test scores of clinical knowledge and competence of III- and IV-year B.Sc Nursing students on Tracheostomy care

**Effectiveness**– In this study, it refers to statistically significant improvement in clinical knowledge and clinical skill performance of third- and fourth-year B.Sc. Nursing students on Tracheostomy Care after the implementation of the OSCE as measured by the post-test scores of clinical knowledge and clinical skill performance which is measured by a structured questionnaire and skill performance observational check list.

**OSCE:** In this study it refers to a systematically developed objective type of structured/planned programme in the laboratory setting to assess the clinical knowledge and clinical skill competence of III- and IV-year B.Sc Nursing students' performance on Tracheostomy Care that comprises a circuit of short (5-10minutes) station, in which each student is examined on a one-to-one basis with mannequins (Simulated patient).

**Traditional Clinical Examination:** In this study it refers to evaluating the clinical knowledge and clinical skill competence of III- and IV-year B.Sc Nursing students on Tracheostomy Care through questionnaire and criteria based observational check list.

**Undergraduate Nursing Students:** Refers to students, studying in third- and fourth-year Bachelor programme in selected Nursing educational institutes at Bhopal M.P

**Clinical Knowledge:** It refers to the students' understanding regarding the selected nursing procedure i.e., Tracheostomy care that is under OSCE which is measured by a structured questionnaire. The level of knowledge is categorized as inadequate, moderately adequate and adequate knowledge based on the percentage of knowledge score obtained by each subject.

**Clinical skill competence:** Refers to the students' ability to perform the selected nursing procedures i.e., Tracheostomy care that is under OSCE and learned through OSCE by the Nursing students that strengthen effective

or superior performance in their professional area which is categorized as low, moderate and high competence based on the post test scores by each student.

**Tracheostomy care:** It is a care given to the patient who has undergone tracheostomy which includes Tracheal suctioning, Cleaning and replacing the inner cannula, Cleaning Stoma, Changing the Sterile Dressing and changing the tracheostomy ties using aseptic technique. In this study it refers to the performance of tracheostomy care procedure by III- and IV-year B.Sc Nursing students.

**Selected Nursing institute:** Refers to College of Nursing conducting four-year Baccalaureate programme in Nursing and affiliated to Madhya Pradesh Medical Science University approved by Indian Nursing Council and Madhya Pradesh Nurses' Registration Council located in Bhopal namely Career College of Nursing, Pragyan College of Nursing, Kasturba College of Nursing, Sunder Devi College of Nursing and Mar Baselios College of Nursing in Bhopal.

### Assumptions

It was assumed that:

1. Under graduate nursing students may be able to demonstrate and also master their clinical skill competence in the practice of Tracheostomy Care procedure through learning and evaluation by OSCE to provide safe and quality care to the patients with Tracheostomy.
2. The important criteria of clinical evaluation such as objectivity, reliability, validity, uniformity and acceptability may be high in OSCE when compared to TCE.
3. Objective Structured Clinical Examination (OSCE) may be accepted as a practical strategy for examining clinical skills of students at all levels.

### Delimitation

**The study was delimited to**

1. 3<sup>rd</sup> and 4<sup>th</sup> year under graduate B.Sc nursing students.
2. Commonly used teaching and clinical strategy

### Conceptual Framework

Jennet W. Kenny's open system model has been adopted for this study, which was formulated in the year of 1999. By this theory J.W. Kenny states that all living things are open and they are in continuous exchange of matter, energy and information which results in varying degree of interaction with the environment from which the system received input and gives back output as matter, energy and information.

**The literature related to the present study was reviewed under the following headings:**

**Part – I** - Literature related to Objective Structured Clinical Examination

**Part – II** - Literature related to Traditional Clinical Examination

**Part – III** - Literature related to Objective Structured Clinical Examination versus Traditional Clinical Examination

**Part – IV** - Literature related to Tracheostomy Care

**Part – I** - Literature related to Objective Structured Clinical Examination

## METHODOLOGY

### Research Design and Approach

Quantitative Evaluative - comparative research approach was used and A True experimental designs consisting of post-test only control group design was used in this study

### Setting

The study was conducted among students from selected Nursing Colleges situated in Bhopal namely Career College of Nursing, Pragyan College of Nursing, Kasturba College of Nursing, Sunder Devi College of Nursing and Mar Basellos College of Nursing, these colleges offer four-year Basic B.Sc Nursing and other Nursing courses like Post Basic BSc Nursing and Post Graduate Nursing courses with annual student intake capacity of 40,60,40 and 50 respectively for B.Sc Nursing course with adequate faculty position as per norms of the statutory bodies.

### Population

**Target Population:** The population of this study was all undergraduate nursing students who were studying in Third- and Fourth-year B.Sc Nursing course.

**Accessible population :** All undergraduate nursing students who were currently studying in Third- and Fourth-year B.Sc Nursing course for the academic year 2020 -21 in selected Colleges of Nursing, Bhopal.

### Sample

All Undergraduate students who were studying in Third- and Fourth-year year B.Sc Nursing Course in the selected Nursing Colleges, Bhopal during the study period and who fulfilled the inclusion criteria.

### Sampling Process

Power analysis was carried out to calculate the estimated sample size. Sample size estimation was done by using previous study of performance of Nursing Students in Psychiatric Nursing using Objective Structured Clinical Examination Versus Traditional Practical Examination (TPE) with the OSCE score of 78.10%. 15% more OSCE score was expected than the control group in the study. The sample size (n) was estimated with 5%  $\alpha$  error and 20% $\beta$  error (80% power). The desired sample size was found to be 110 for each group.

By using the data of pilot study. The sample size was calculated by using power of level of confidence. The total sample size of this study was 220 (110 in experimental group and 110 in control group).

### Sample size

A total of 220 students (i.e., 110 in the experimental group + 110in the control group) of Third- and Fourth-year B.Sc Nursing Course from the selected Nursing Colleges in Bhopal were the samples of this study.

### Sampling Technique

Simple Random Sampling technique was used to select the study subjects in this study and was randomly assigned to the experimental and control group.

### Criteria for Sample selection

**Inclusion Criteria:** Under graduate nursing students who:

- were presently studying in Third- and Fourth year BSc nursing Course who received teaching on Tracheostomy care.

- were willing to participate in the study

### Exclusion Criteria

The study was limited to the under graduate nursing students who:

- Were not willing to participate in the study
- were not available during data collection period
- were having previous OSCE knowledge and experience

### Research study Tools and Data Collection Technique

The instruments were prepared by the investigator after a detailed review of related literature and with the guidance of experts. The tools used for this study were;

1. Structured Knowledge Questionnaire
2. Observational Checklists for skill performance in OSCE (Experimental Group)
3. Criteria based observational check list for skill performance in TCE (Control Group)
4. Structured Opinionnaire (5-point Likert Scale-satisfaction scale)

### Description of Tool

#### 1. Structured Knowledge Questionnaire

**Part I:** This section consisted of demographic data of Undergraduate Nursing Students (BSc Nursing III & IV year). The socio-demographic characteristics collected included were items i.e., 1. Age in years, 2. Gender, 3. Year of study, 4. Source of information, 5. Previous year academic performance and 6. Previous knowledge and experience of undergoing OSCE.

**Part II:** It consisted of questions for testing the knowledge related to Tracheostomy Care It comprised of 30 multiple choice questions with four response options out of which only one was the correct response.

#### 2. Observational Checklists for skill performance in OSCE (Experimental Group)

Observational checklist was used to assess clinical skill performance on Tracheostomy care under OSCE in seven skill stations i.e., 1. Quiz on Tracheostomy Care 2.Collection of Equipment 3.Preliminary assessment of patient 4. Tracheal suctioning 5. Cleaning and replacing inner cannula 6.Cleaning Stoma, changing Sterile Dressing and changing tracheostomy ties 7.Documentation. OSCE Observational checklist was prepared based on the standard guidelines formulated for Tracheostomy care as per renowned nursing authors.

### Scoring Pattern

All items in the observational check list for OSCE skill performance were designed with options of Performed (or) not performed. If item was performed a score of “1” was given and if item was not performed “0” was given. The score percentage was calculated by adding score obtained for each item for which the percentage was found at the end.

#### 3. Criteria based observational check list for skill performance in TCE (Control Group)

Criteria based observational check list was used to assess clinical skill performance of undergraduate nursing students under Traditional Clinical Examination method. It had six domains i.e., 1. Collection of equipment 2. Preparation of client and equipment 3. Tracheal suctioning 4.Cleaning and replacing the inner cannula 5.Cleaning Stoma, Changing the Sterile Dressing and changing the tracheostomy ties 6.Documentation. Criteria based

Observational checklist was prepared by the researcher based on the standard guidelines formulated for Tracheostomy care as per renowned nursing authors.

Domain	Score	Performance / Skill	Maximum Score
I	19	Collection of equipment	19
II	11	Preparation of client and equipment	11
III	21	Tracheal suctioning	21
IV	15	Cleaning and replacing the inner cannula	15
V	23	Cleaning Stoma, Changing the Sterile Dressing and changing the tracheostomy ties	23
V1	7	Documentation.	7
<b>Total</b>	<b>96</b>		<b>96</b>

### Scoring Pattern

All items in the Criteria based observational check list for skill performance were designed with options of Performed (or) Not performed. If item was performed a score of “1” was given and if item was not performed “0” was given. The score percentage was calculated by adding score obtained for each item for which the percentage was found at the end. The score was interpreted as follows,

>75<sup>th</sup> percentile- Adequate performance

50 – 75<sup>th</sup> percentile - Moderately Adequate performance

< 50<sup>th</sup> percentile - Inadequate performance.

The overall score of each subject in knowledge and skill (for both the groups) was added together to convert it into a competency score. Total competency score of each subject was converted into percentage and interpreted as follows,

>75<sup>th</sup> percentile - Adequate competence (High)

50 – 75<sup>th</sup> percentile - Moderately Adequate competence (Moderate)

<50<sup>th</sup> percentile - Inadequate competence (Low)

### 4. Structured Opinionnaire (5-point Likert Scale-satisfaction scale)

Structured Opinionnaire for students contained 20 statements which represents about their opinion in learning and gaining self-confidence towards OSCE for Tracheostomy Care.

Each statement had five options with one most appropriate answer, further to assess the opinion towards OSCE by students; the responses were categorized in to five grades. i.e. ‘Strongly Agree’, ‘Agree’, ‘Uncertain’, ‘Disagree’ and ‘Strongly Disagree’ and the scoring was ‘five’, ‘four’, ‘three’, ‘two’, and ‘one’ respectively. This tool was instituted for experimental group.

### Validity

The content validity of the tool was ascertained in consultation with nine experts in the field of Nursing – Medical Surgical Nursing speciality, Nursing Education & Administration, Medicine – E.N.T and Statistics

### Reliability

Reliability of the tool was assessed by using Test – retest, Inter- rater methods. Structured Questionnaire to assess the knowledge and the Likert Satisfaction Scale for opinion were tested using test-retest method. The obtained reliability correlation co- efficient (Cronbach’s Alpha) of knowledge questionnaire and Satisfaction Scale value were  $r = 0.82$  and  $r = 0.91$  respectively. Observational checklist for OSCE skill score for experiment group

reliability correlation coefficient value was  $r = 0.90$  and observational checklist skill score for control group reliability correlation coefficient value was  $r = 0.92$ . The tests were reliable and were used in this study.

### **Ethical Considerations**

The study was conducted after getting approval from the ethical committee of LNCT University, Bhopal. Permission to conduct the study was obtained from the Management / Principals of the Nursing Colleges. Each subject who fulfilled the inclusion criteria and observers were given an explanation about the study and asked for their willingness to participate. Informed written consent was obtained from each subject in the consent form. Anonymity and confidentiality of the subjects were maintained throughout the study.

### **Pilot study**

To evaluate the feasibility, clarity, time needed for data collection and applicability of the tools developed a pilot study was carried out on 20 (10% of students) III- and IV-year B.Sc Nursing students from 10/03/2021 to 24/03/2021 at Kasturba college of Nursing, Bhopal. Students who participated in the pilot study were excluded from the main study subjects.

### **Changes done after Pilot trial:**

Minor changes were made in the observational check list for OSCE – Skill Station – II for the collection of equipment and the post test was conducted after 10 days of intervention instead of 14 days due to uncertainty of students' availability during the pandemic and due to ongoing University examinations as per experts' guidance.

### **Establishment of OSCE Skill Lab**

Researcher prepared an OSCE skill lab in Kasturba College of Nursing and in Mar Baselios College of Nursing Bhopal for conducting the study. Foundations of Nursing Lab was modified as OSCE skill lab and the same lab was used to evaluate the students under TCE method with needed modifications. There were seven skill stations arranged with instructions to be followed by students at each station within the allocated time i.e 10 minutes. They were named as,

**SKILL STATION I** for taking a short quiz on Tracheostomy care

**SKILL STATION II** for collecting equipment for each station

**SKILL STATION III** for Preliminary Assessment of the Patient

**SKILL STATION IV** for performing Tracheal suctioning

**SKILL STATION V** for cleaning and replacing the inner tube

**SKILL STATION VI** for Cleaning Stoma, Changing the Sterile Dressing and changing the tracheostomy ties

**SKILL STATION VII** for Documentation

**TCE:** This was conducted for the control group students one day before conducting the OSCE for the experimental group students. The same lab set up was modified with one patient unit (manikin) which had all the facilities for performing the Tracheostomy care procedure. Students were observed and evaluated under the customary way (i.e., TCE method) and as per the observational check list with viva.

Students who were evaluated by Traditional Clinical Examination performed the tracheostomy procedure in one patient unit (manikin) arranged for the examination.

**Data Collection procedure:** After obtaining permission from Deans / Principals of Nursing colleges the researcher got the list of III & IV-year B.Sc Nursing students who fulfilled the study criteria, from the class

coordinators. As per the prepared time schedule the researcher went to the nursing institutes and met the III year and IV-year students separately. Through Simple Random Sampling Method by using the Lottery method students were selected and equally allotted to experimental (110nos.) and control group (110nos.) from each year. Out of which again equal number of students were allotted from III year i.e.,55 students for experimental and 55 students for control group and from IV Year i.e.,55 students for experimental and 55 students for control group thus making a total of 220 study samples. Informed written consent was obtained from each subject after explaining the purpose and the methodology of the study.

Planned teaching and demonstration on Tracheostomy care were administered to the OSCE group of students on the first day of the study. Following which they were provided with detailed instructions related to OSCE method and its assessment in terms of instructions to be followed by them in each skill station, equipment to be used in each skill station and marking system for their performance and allocated time for each station. Students were also directed to what was required of them at each station; they also received additional information on Tracheostomy care and procedure. They were also informed to convey their opinion about OSCE method for learning Tracheostomy care at the end of the examination. Students who were evaluated by TCE method (Traditional Clinical Evaluation) received routine teaching and demonstration on Tracheostomy care and did not receive any information on OSCE method for Tracheostomy care.

On the 11th day, for one selected college study participants, first the researcher conducted a post-test through Self-Structured Knowledge Questionnaire for testing the clinical knowledge related to Tracheostomy Care among experimental group and control group of students. Time taken by the students to complete the knowledge questionnaire was 30minutes. On the same day students from control group (TCE students) were assessed by the traditional clinical examination method for tracheostomy care by the trained observers. Their clinical skill was assessed through criteria based observational check list. Students were given 15 minutes to complete the procedure. In a day, not more than 20 students were examined.

Next day the skill assessment for experimental (OSCE students) was carried out on the basis of the observational checklist for each skill station. Each student was provided opportunity to perform the procedure in the respective stations for Tracheostomy care. (i.e., from skill station I to VII) They were assessed using the OSCE assessment format for the Tracheostomy care procedure kept in the respective stations. The same technique was followed for rest of study participants till the end of data collection procedure.

There were totally seven skill stations set to perform the Tracheostomy care procedure under OSCE and each station had one trained observer with the observational checklist pertaining to the procedure for the specific station. Students performed the procedure on the mannequins by using the needed equipment arranged in the skill lab. Students started from the first skill station on hearing the first bell sound and moved from one station to next station on hearing subsequent bell sounds at every 10 minutes which enabled the students to spend 10 minutes in each station to perform the procedure. During the OSCE session each student spent 70 minutes to complete the entire procedure of Tracheostomy care. Students who completed the OSCE were not given chance to meet rest of the students who were waiting for the examination. In a day, not more than 20 students were examined. The same process was continued for all the college students who were selected as samples for the study.

During the OSCE session, the subjects were assessed by the trained observers (i.e., PG Faculty members with Medical Surgical Nursing speciality who had minimum three years of teaching experience with nursing students after their PG degree).

In order to avoid any bias in the study, either IV year or III-year students were selected for the study from one study setting.

**Table 1 Distribution of subjects according to their socio demographic variables in the experimental and Control group.**

(N=220)

Demographic Profile		Group				Chi square test ( $\chi^2$ )	p Value
		Experiment(n=110)		Control(n=110)			
		f	%	f	%		
1.Age	18-20 years	17	15.45%	17	15.45%	1.69	0.42(NS)
	21-23 years	86	78.18%	90	81.82%		
	24-26 years	7	6.36%	3	2.73%		
2.Gender	Male	5	4.55%	6	5.45%	0.10	0.76(NS)
	Female	105	95.45%	104	94.55%		
3.Year of Study	III Year B.Sc Nursing	55	50.00%	55	50.00%	0.00	1.00(NS)
	IV Year B.Sc Nursing	55	50.00%	55	50.00%		
4.Source of Information	Self-Learning	0	0.00%	0	0.00%	0.00	1.00(NS)
	Class room teaching	110	100.00%	110	100.00%		
5.Academic performance	Distinction and above	43	39.09%	39	35.45%	2.00	0.36(NS)
	First Class / Division	66	60.00%	67	60.91%		
	Second Class / Division	1	0.91%	4	3.64%		
6.Previous OSCE Knowledge & Experience	Yes	0	0.00%	0	0.00%	0.00	1.00(NS)
	No	110	100.00%	110	100.00%		

NS= not significant P >0.05 not significant

**Table 2 Comparison of Level of knowledge score regarding tracheostomy care among Undergraduate Nursing students**

Level of knowledge score	Group				Chi square test
	Experimental		Control		
	Frequency	Percentage	Frequency	Percentage	
< 50%	0	0.00%	20	18.18%	$\chi^2=115.56p=0.001^{***}$ DF=2 significant
51%-75%	5	4.54%	63	57.27%	
76%-100%	105	95.46%	27	24.54%	
Total	110	100.00%	110	100.00%	

DF= Degrees of freedom \*\*\*p<0.001 very high significant

**Table 3 Comparison of mean knowledge score regarding Tracheostomy care among Undergraduate Nursing students**

Experimental (n=110)		Control (n=110)		Mean Difference	Student's independent t-test
Mean	SD	Mean	SD		
91.10	4.49	65.18	14.48	25.92	t=17.99 p=0.001 *** DF=218 Significant

DF=

Degrees of freedom \*\*\*p<0.001 very high significant

**Table 4 Percentage distribution of Clinical skill performance by OSCE method on Tracheostomy Care in the Experimental Group**

Skill Station No.	Skills Performed	Skill score obtained			
		Maximum score	Mean score	SD	Percentage of Mean score
I	Quiz on Tracheostomy Care	10	9.21	1.13	92.10%
II	Collection of Equipment	36	35.03	1.15	97.31%
III	Preliminary assessment of the patient	10	9.34	0.96	93.40%
IV	Tracheal Suctioning	28	26.53	1.06	93.40%
V	Cleaning and replacing the inner cannula	26	25.37	0.76	97.58%
VI	Cleaning Stoma, Changing the Sterile Dressing and changing the tracheostomy ties	34	31.78	1.04	93.47%
VII	Documenting all relevant information	7	5.91	1.09	84.43%
<b>Total</b>		<b>151</b>	<b>143.16</b>	<b>3.92</b>	<b>94.80%</b>

**Table 5 Percentage distribution of Clinical skill performance by OSCE method on Tracheostomy Care in the Experimental Group**

Skill Station No.	Skills Performed	Skill score obtained			
		Maximum score	Mean score	SD	Percentage of Mean score
I	Quiz on Tracheostomy Care	10	9.21	1.13	92.10%
II	Collection of Equipment	36	35.03	1.15	97.31%
III	Preliminary assessment of the patient	10	9.34	0.96	93.40%
IV	Tracheal Suctioning	28	26.53	1.06	93.40%
V	Cleaning and replacing the inner cannula	26	25.37	0.76	97.58%
VI	Cleaning Stoma, Changing the Sterile Dressing and changing the tracheostomy ties	34	31.78	1.04	93.47%
VII	Documenting all relevant information	7	5.91	1.09	84.43%
<b>Total</b>		<b>151</b>	<b>143.16</b>	<b>3.92</b>	<b>94.80%</b>

**Table 6 Comparison of mean clinical skill score regarding Tracheostomy care among Undergraduate Nursing students**

Experimental (n=110)		Control (n=110)		Mean Difference	Student's independent t-test
Mean	SD	Mean	SD		
143.16	3.92	49.50	13.43	93.66	t= 70.187; p=0.000*** DF=218. Very Highly significant.

DF= Degrees of freedom \*\*\*p<0.001 very high significant

**Table 7 Comparison of competency score between Experimental and Control group**

Level of score	Experimental Group		Control Group		Chi square test
	Frequency	Percentage	Frequency	Percentage	
Inadequate	0	0.00%	29	26.36%	$\chi^2=155.19$ $p=0.001^{***}$ DF=2 significant
Moderate	0	0.00%	62	56.37%	
Adequate	110	100.00%	19	17.27%	
<b>Total</b>	<b>110</b>	<b>100.00%</b>	<b>110</b>	<b>100.00%</b>	

(DF= Degrees of freedom \*\*\*p=0.001 very high significant)

**Table 8 Correlation between clinical knowledge score and clinical skill competence score in the Experimental Group.**

Correlation Between	Mean gain score Mean $\pm$ SD	Karl Pearson Correlation coefficients	Interpretation
Clinical Knowledge score Vs Clinical Skill competence score	91.10 $\pm$ 4.49 143.16 $\pm$ 3.92	r= 0.43 P >0.01**(significant)	Moderate positive correlation

**Association between the post-test level of clinical knowledge, clinical skill competence regarding tracheostomy care and selected demographic variables in the experimental group and control group.**

There was no significant association between with clinical competency score and demographic variables among the subjects in the experimental group.

There was a significant association between the Clinical competence score and demographic variables in the control group with the year of study. Fourth year students' competence score was more than third year students' clinical competence score.

There was a significant association between the age group of 21 – 26 years and clinical knowledge score among the subjects in experimental group. They had more adequate knowledge score than other age group of students.

There was a significant association between the clinical knowledge score and demographic variables in the control group with the year of study. IV-year students had more clinical knowledge score than III-year students.

**Relationship between clinical knowledge and clinical skill competence regarding Tracheostomy care among Undergraduate Nursing students.**

- ✓ There was a moderate positive correlation between clinical knowledge score and clinical skill competence score in experimental group.
- ✓ There was a poor positive correlation between clinical knowledge score and clinical skill competence score in control group.

**Opinion / satisfaction towards OSCE for Tracheostomy care among Undergraduate Nursing students**

- The maximum score of 97.60% was given for the statement “OSCE helped you to gain more knowledge on Tracheostomy care” among the experimental students
- The minimum score of 91.80%. was given for the statement “OSCE was fair in terms of performing the skills taught to you”.

- 87 (79-09 %) of them are having 91%-100% of level of satisfaction towards learning Tracheostomy care through OSCE.
- There was a significant association between the level of satisfaction and the demographic variable with the year of study. Fourth year students had more satisfaction score than III-year students towards learning Tracheostomy care through OSCE.

### **Limitations of the Study**

- ❖ As the study was conducted during this ongoing pandemic situation researcher had faced a few problems like not being able to involve the students from a greater number of nursing colleges in Bhopal as most of the colleges were conducting online classes.
- ❖ Students who had at least one dose of COVID -19 vaccine were only involved in the study, COVID appropriate behaviour and protocols were to be ensured among the students, researcher and observers throughout the study period to curtail pandemic situation.
- ❖ Also, it requires special budget and technology to design OSCE stations. Number of teachers (observers) and special training is needed for teachers (observers) before implementing.
- ❖ Though the study was conducted in five nursing intuitions, the sample was relatively too small to be generalized to all nursing students' population. The observation was done at a single point of contact, so that predictive validity cannot be established.

### **Nursing Implications**

#### **Nursing Practice**

OSCE would help nurses to be put through an objective assessment covering a wide area of content and skills in various clinical procedures so that they can face real world situations with more confidence

In OSCE clinical skills are tested and then practiced repeatedly until one perfect the skill where students are rotated through the stations and complete all stations in the circuit, without omitting any sequence of the practice.

As this method has a practice of breaking up the procedure into simpler components, students would find it easy to practice and hone their skills in a specified aspect.

Students may be rotated through the needed station alone also, before they enter in to actual clinical practical experience in order to avoid the risk of practicing on real client.

Moreover, through OSCE high risk procedures may be practiced a number of times in the practice settings before they enter into the actual clinical settings, thereby avoiding life-threatening risk to clients in real world environment.

#### **Nursing Education**

In India, OSCE has been recently introduced by the Indian Nursing Council (INC) and most of the State universities in the nursing curriculum as part of the practical examination.

Emphasis should be given more to the nursing curriculum, supporting the need for practicing OSCE as a part of formative and summative evaluation in addition to the existing methods in the clinical areas.

Nursing College in-charges and faculty members should pay attention to implement OSCE wherever possible in the clinical postings to test the wide range of hands-on clinical skills and competencies of the nursing students.

Nursing faculty members must be trained and prepared adequately so as to conduct the OSCE with greater emphasis on preparation of OSCE stations and check lists.

OSCE also can come in handy when there is scarcity of patients or unavailability of procedures in the clinical areas at the time of clinical postings of the students. Students can learn and practice the missed-out procedures in the OSCE skill lab set up in the Colleges.

In the OSCE method, sharing of evaluation of clinical skills is essential feedback which plays an important motivating role between students and teachers to ensure the quality and appropriateness of a learning process.

### **Nursing Administration**

As a person holding key administrative position in Nursing Institutions like the Dean or Principal or Chairperson at the helm of affairs of the college who is aware of the effectiveness of OSCE in curriculum, should advise the various forums and committees of University / Educational bodies by providing suggestions on making evaluation methods more valid, reliable and objective by introducing OSCE, even alongside existing method, to enhance the standard of assessment of the nursing students' clinical skill competence.

As the implementation of OSCE requires extensive planning, logistic support and team work, administrators in the hospital should enable nursing faculty members in organizing the OSCE through mobilization of resources.

Administrators must encourage and support the faculty members in conducting OSCE as a routine examination by providing appropriate infrastructure and funds.

Nursing administrators in Education and Service should also plan in organizing and conducting workshops and short-term courses on OSCE to empower the students, faculty members as well nursing staff in implementing OSCE effectively.

### **Nursing Research**

If studies are planned with large number of students there may be a need for other set of trained observers for rotation, it may help the researcher to reduce the error in data collection.

Also, researches may be undertaken to assess the quality of professional skills of trained nurses for quality care check under OSCE in India.

The OSCE is a significant high potential researchable area in education as it has different types of extensive data which can be used for different purposes.

Nursing, being at par with other health disciplines especially medical education, should not lag behind due to lack of research in assessment especially on OSCE. Thus, it is high time that nursing researchers initiate research on OSCE, by using the findings of this study as baseline data. This study can be replicated for different subjects by overcoming the limitations of the current study.

### **Recommendations**

- A similar study can be carried out with large number of sample and in different settings.
- Longitudinal studies may be carried out with the same problem statement.
- OSCE versus TCE for the same procedure can be done under mixed methodology.

- A study to compare the station wise performance of the samples can be done to sort out the difficult steps for the students for the same study.
- OSCEs should be integrated within a curriculum in conjunction with other relevant student evaluation methods.
- Though OSCE is costly and time-consuming process efforts should be made to include it in internal assessments so that both teachers and students get benefitted out of the new method of evaluation.
- Studies may be carried out to test the level of competency of staff nurses by checking the quality of client care through OSCE.
- Periodical reinforcement may be given to the nursing faculties in updating knowledge on OSCE.
- Although the OSCE's advantages over TCE is proven, OSCE can be coupled with TCE in both formative and summative assessments to ensure a comprehensive evaluation of nursing students' clinical skill competencies.

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