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Research Article

Comparison Of Traditional Teaching Versus Brain Based Learning On Clinical Performance Of Nursing Students

Dr. Mrs. Kirti M. Jamdar[1*], Dr. Mrs. Prabha K. Dasila[2]

[1*]Assistant Professor, L.T. College of Nursing, S.N.D.T Women's University, 1- NT Road, New Marine Lines, Church gate – Mumbai, India 400020 kirti.tawsalkar@gmail.com
[2]Professor & Director, MGM New Bombay College of Nursing, MGM Institute of Health Sciences, Sector – 1, Kamothe, Navi Mumbai. India – 410209

Abstract:
Background: Clinical performance is the outcome of combinations of knowledge and skills, which are measured by using various tools. The improvement in clinical performance, not only improves the skills but also has its impact on the attitude and confidence of students. Improvement of clinical performance directly affects patient satisfaction about the services provided. Objectives: To compare clinical performance of students in the traditional teaching group and the Brain Based Learning group. Material and Methods: Two-group posttest design was used. The sample size consisted of 225 third-year B.Sc. nursing students. Non-probability convenience sampling approach was used. The data collection tools included Bedside clinic format, Clinical
Evaluation format and Observation checklists which assessed post intervention.
Analysis: At the post-test 3, the clinical evaluation mean of the study group was 64.81 as opposed to the control group mean of 63.07, which highlights a significant change at the 0.05 level of significance. The mean clinical performance of the study group compared to the control group displayed a significant improvement in the clinical performance that was analyzed using bedside clinic scores and simulation-based scores.

Key words: Traditional Teaching, Brain Based Learning, Clinical Performance

***Author of Correspondence Email:** kirti.tawsalkar@gmail.com

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Introduction

"Clinical performance" typically refers to the effectiveness, efficiency, and quality of care provided by healthcare professionals in a clinical setting. It encompasses various aspects of care such as accuracy of diagnosis, treatment outcomes, patient satisfaction, adherence to best practices and guidelines, and overall delivery of healthcare services. It is often assessed through different metrics, evaluations, and feedback mechanisms to ensure high standards of care and continuous improvement in healthcare delivery.

In nursing education, "clinical performance" refers to the ability of nursing students to apply theoretical knowledge and practical skills in real-world clinical settings. It involves the demonstration of clinical competencies, critical thinking, effective communication, professionalism, and ethical practice while caring for patients under the supervision of clinical instructors. Evaluating clinical performance in nursing education often involves assessments, simulations, preceptor feedback, and reflective practices to ensure that students are prepared to deliver safe and competent patient care upon graduation and licensure.

Objective
To compare clinical performance of students in the traditional teaching group and the Brain Based Learning group.

Null Hypothesis:
There will be no significant difference in the clinical performance of students between the traditional teaching group and the Brain Based Learning group before and after the intervention at 0.05 level of significance.

Materials and Methods:
This study involved various tools for data collection like Bedside clinic format, Clinical Evaluation format and Observation checklists for demonstration of Hand washing competence checklist, Wearing PPE, Performing Endotracheal Suctioning, BLS, Care of patient on Mechanical Ventilator. Content validity of the tools was ascertained from the experts in the field of nursing and general education. The study was conducted in different nursing colleges of nursing under State Health University Maharashtra.

Participants: The target population was made up of third-year B.Sc. nursing students from the nursing colleges in Mumbai and Navi Mumbai as per the inclusion criteria of the study. Students who provided the consent to participate were included. The students who were granted Allowed to Keep Term (ATKT) by the university were excluded from the study.
The researcher randomly selected the nursing colleges and divided them into the study and control groups. There were overall 225 participants available (115 in the study group and 110 in the control group). The critical care nursing topic was taught to the study and control groups within the time allotted by the teaching staff after the researcher had obtained the necessary consent from the authorities. The Study group was taught using a Brain Based Learning approach while the control group with Traditional teaching method.
The demonstration and returned demonstrations were shown by both the groups. The Study group was involved in Case based learning apart from the treatment which was the part of the BBL training. Simulation-based instruction was followed for both the groups. Bedside clinics were used for the clinical evaluation and scores were obtained at the end of the posting in both the groups.

Ethical Considerations:
The study was approved by the Ethics Committee for Research on Human Subjects of MGMIHS Kamothe, Navi Mumbai. The study was approved by the administrative authorities of the institutions participating in the study. Consent was obtained from the participants prior to the data collection.

Data Analysis:
The data was examined using SPSS software. The demographic factors included the participant's age, favorite subject, and qualifying exam percentage.

Results:
The demographic data revealed that a maximum of 70% students in the study group and 69% students in the control group were found at the age ranging from 18 to 20 years. The majority of students in the study group (76%) and control group (62%) reported Medical Surgical Nursing as their preferred subject.

Table No 1: ***Clinical performance of students in study group based on overall clinical evaluation*** **n = 115**

Grade	Score	Evaluation 1 (1 month)	Evaluation 2 (6 month)	Chisquare Test	p Value	nificant at 5% level
Fair	50 - 59	32	21			
Satisfactory	60 - 69	76	87	3.025	0.220	NS
Good	70 - 79	7	7			

50 - Poor Grade, 80 – 89 – Very Good and > 90 - Outstanding

Table No 1. reveals that, majority of students in the study group received 1 or 2 scores and the students were found neither in bad or excellent grades.

Table No 2: ***Clinical performance students in control group based on overall clinical evaluation*** **n = 110**

Grade	Score	Evaluation 1 (1 month)	Evaluation 2 (6 month)	Chip square Value	Test	Significant at 5% level
Fair	50 - 59	35	20			
Satisfactory	60 - 69	70	83	5.529	0.063	NS
Good	70 - 79	5	7			

< 50 - Poor Grade, 60 - 69 Satisfactory, 80 – 89 – Very Good and > 90 – Outstanding Table 2. The preceding data illustrates the clinical performance as determined by the clinical evaluation of students in the control group. The students were found to be having satisfactory grades.

Table 3: ***Comparison of Mean Clinical Evaluation score achieved by students in study and control group*** **n = 225**

Items	Group Study (n = 115) Mean	SD	Control (n = 110) Mean	SD	Independent t test	p value	Significant at 5 %
Personal and Professional Behavior	12.00	1.05	12.89	1.15	6.063	<0.001	S
Attitude towards Coworkers and patients	11.66	1.37	13.32	1.51	8.618	<0.001	S
Application of knowledge	18.63	1.11	17.94	1.63	3.718	<0.001	S
Clinical skill	20.24	2.35	18.29	1.22	7.779	<0.001	S

The comparison of item-wise mean clinical evaluation scores as achieved by students in the study and control groups are highlighted in the Table no. 3. The mean scores of the majority of items for knowledge application and clinical skill in the study group were found higher as compared to the control group. The statistical analysis revealed a significant difference between the two groups at the 0.05 level of significance.

Table 4: ***Comparison of Mean Bed Side Clinic Evaluation score achieved by the students in study and Control group*** **n = 225**

Items	Group Study (n = 115) Mean	SD	Control (n = 110) Mean	SD	Independent t test	p value	Sig. at 5 %
Knowledge about the patient	3.01	0.66	3.12	0.40	1.504	0.134	NS
Understanding about the disease condition	4.14	0.95	3.48	0.52	6.376	<0.001	S
Case Presentation for Nursing Management	4.65	0.78	3.75	0.58	9.741	<0.001	S
Time management	1.97	0.53	2.44	0.50	6.873	<0.001	S
Attitude towards patient care	1.54	0.50	2.51	0.50	14.505	<0.001	S

Table No 4. illustrates that, there was a significant difference in the mean was found for all the items of bedside clinical evaluation between the study and control groups except regarding knowledge of patients. It indicates that the understanding about the disease condition, case presentation for nurse management, time management and attitude towards patient care was found better in students of the study group.

Figure 1: ***Mean scores of Simulation Based Clinical Performances among Study and Control Group***

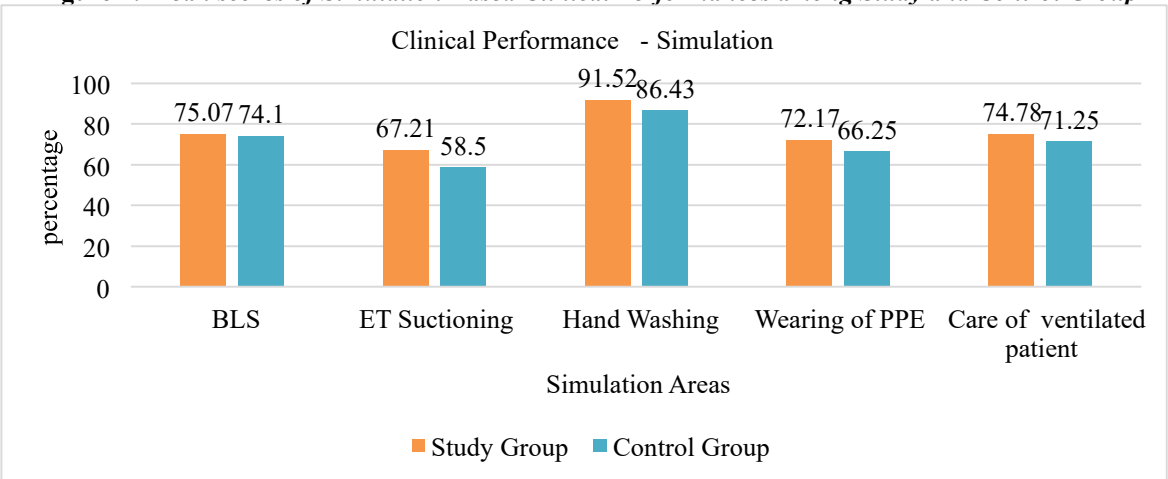

Figure no. 1. describes the results of various nursing procedures demonstrated by the students and control group. These are ET suctioning, hand washing, donning Personal Protective Equipment (PPE), and basics of care for patients on ventilators. A significant difference in the mean was found in all items except for the mean scores of Basic life support.

Table 5 :*Overall Clinical performance of students in study and control group post intervention.* n = 225

	Group						
Clinical Performance	Study (n = 115) Mean	SD	Control (n = 110) Mean	SD	Independent t test	p value	nificant at 5% level
Bedside Clinic	16.34	2.04	15.50	1.96	3.13	0.002	S
Clinical Evaluation	64.81	5.81	63.07	6.64	2.09	0.037	S
Simulation Based Evaluation	76.15	5.10	71.31	3.52	8.246	0.001	S

Overall performance of the students in study and control groups was measured for bedside clinic, clinical evaluation, and simulation-based evaluation scores and a significant difference was found in the performance of students between the study and control groups at 0.05 level of significance.

Table 6: *Comparison of Mean Clinical performance scores of students in study and control group.* n = 225

Group	Mean	SD	Independent t test	p value	Significance
Study (n = 115)	66.45	2.98			
			3.354	0.001	S
Control (n = 110)	65.13	2.91			

A significant difference in clinical performance of students in the study and control group was found at 0.05 level of significance. Hence the null hypothesis is rejected as the t value 3.354 is at 0.001 level of significance and it is interpreted that the Brain Based Learning improves Clinical Performance of Nursing Students

Discussion:

The clinical performance of students in the present study was found with a significant difference when comparing the students in the traditional teaching group and brain based learning group. Klinek S., who found the most substantial, favorable, and robust correlations between knowledge and behaviors (r =.59, p .001), provided support for the study's conclusions[1].

In the control group baseline mean was 71.31 while the study group baseline mean of 76.15 which changed after the intervention. These findings are supported by the study conducted by Adiansha et al. in which the ANOVA F = 4,93; F = 4,15 results demonstrated a difference between college students who were taught using the BrainBased Learning Model and those who were taught using the Discussion Learning Model with regard to their understanding of mathematical concepts [2].

The case presentation for the nursing management component of the bedside clinic revealed a significant difference between the study group mean of 4.65 and the control group mean of 3.75. This component of present study is supported by Salem study[3] which describes that the brain-based learning is an excellent method for enhancing vocabulary recall and retention, lends credence to the study conclusions.

In the study by A. Khalil et al[4]. found that the total mean speaking skills in the control group at the end of the posttest was 10.12 as opposed to the study group's 21.60. Another study that corroborates the conclusions made by Syahbandi L. revealed that the t test value was 4.664 greater than the table value, indicating that the usage of brainbased learning benefits students' speaking abilities [5].

In the current study, simulation-based performance improved from a pretest mean of 71.31 to a posttest mean of 76.15. Lee M-S conducted research on the effects of simulation-based practice on the clinical performance and problem-solving techniques of nursing students highlighted that the impact of simulation-based training is knowledge that has improved (t=14.73, p.001) and clinical nursing abilities (t=15.47, p.001) [6].

In the current study, peer evaluation was employed as a technique in a section of return demonstration. Overall clinical performance in the study group which utilized brainbased learning increased was 65.13 compared to the control group which was 66.45. The research by Double KS backs up the conclusions that peer evaluation has a moderate impact (g = 0.31, p .001) on student performance improvement when compared to instructor assessment or no assessment at all [7].

Conclusion:

The clinical performance was assessed using bedside clinic score and simulation based scores Brain-based learning was found to be enhancing the clinical performance of nursing students for patient care. Apart from overall assessment of students in the real patient care setting the students were also assessed at the simulated scenarios for assessing the competency for Hand washing, Wearing PPE, Performing Endotracheal Suctioning, Basic Life Support and care of patients on Mechanical Ventilator. The students in Brain Based Learning group had better understanding about the disease condition, case presentation for nurse management, time management and attitude towards patient care. Hence it is concluded that the Brain Based Learning improves Clinical Performance of Nursing Students.

By understanding how the brain learns, retains information, and applies knowledge, the nursing educators can design teaching strategies and prepare learning environments for optimizing student engagement, retention, and application of clinical skills. The brain-based learning principles can contribute to improving clinical performance in nursing students by actively learning in real-life patient care scenarios, utilizing multimedia tools, demonstrations, and hands-on practice, linking theoretical knowledge to clinical, feedback and reflection opportunities, and by creating supportive and collaborative learning environments.

Incorporating brain-based learning principles into nursing education can help optimize the learning process and prepare students to excel in clinical practice by leveraging insights from neuroscience to enhance teaching and learning methodologies.

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