

A Study to Assess the Efficacy of Case Study Method on Knowledge and Skill of UG Nursing Students Regarding Chest Physiotherapy in Selected Institution of Dehradun, Uttarakhand

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Abstract: *In nursing education Case Studies are extensively used as a tool for students' clinical learning which is integrated and holistic. A quasi-experimental pre- and post test design was used to evaluate the effectiveness of case study teaching method among B.Sc. Nursing first year students (N=50) of selected nursing institution of Uttarakhand, who were enrolled in year 2017-18, regarding chest physiotherapy. The study was conducted in selected nursing college of Dehradun, Uttarakhand. Total enumeration sampling technique was used for data collection. The purpose of this study was to test the efficacy of case study method on knowledge and skill of UG nursing students regarding chest physiotherapy. Pre-test and post test Mean± sd for knowledge is 11.2± 11.50, 20.7±8.06 & the pre test & post test Mean±SD in term of skill was 2.88± 3.7, 16.84±5.37, "t" value for knowledge & skill was 4.42 & 4.14, which shows a significance improvement in term of knowledge & skill. Findings of this study concluded that case study is an effective teaching strategy to improve knowledge and skill of nursing students. The use of case study method as a teaching strategy is essential to stimulate students to seek knowledge and improve clinical skills future in their professional lives.*

Keywords: Assess, Efficacy, case study, Knowledge, Skill, Chest physiotherapy

1. Background

Nursing education is expected to improve problem solving, decision making, and critical thinking abilities of nursing students in different circumstances^[1]. With the advancement of science, there is a constant increase in the amount of available daily information, which is sometimes called information explosion. Accordingly, students need to actively receive the most recent information, to face future problems with the tools made available by the newest technologies. The deeper and more long-lasting the knowledge of the students, the more effectively they can explain and apply it in reality, which makes them more eager learners^[2].

The core nursing philosophy believes that human beings are bio-psycho-social beings. On that basis in Nursing Education Case Studies are extensively used as a tool for students' clinical learning which is integrated and holistic. But as Nursing is a Caring Profession, it is more appropriate to name it as Nursing Care Study. Selection of teaching strategies is a fundamental component of instructional design. The goal is to help students process information more deeply, which allows them to relate new information to existing ideas or experiences.^[3] Case studies bridge the gap between theory and practice, and between the classroom and the workplace.^[4] They also give students practice identifying the parameters of a problem, recognizing and articulating positions, evaluating courses of action, and arguing different points of view.^[5] Hayward and Cairns state that the use of cases allows students to integrate and apply clinical and basic science knowledge and skills such as clinical reasoning, critical thinking, problem solving, and interpersonal ability to hypothetical or real case scenarios.^[4]

The case study is a helpful strategy in nursing education. It can be used both in the classroom and online courses. It is also suitable for teaching about clinical diseases, culture competence, communication skills, and other topics. A summary or suggestion from the instructor is essential after study.

2. Need for Study

A teaching method comprises of the principles and methods used by teachers to enable student learning. These strategies are determined partly on subject matter to be taught and partly by the nature of the learner as for UG level of nursing students. For a particular teaching method to be appropriate and efficient it has to be in relation to the characteristic of the learner and the type of learning it is supposed to bring about. Suggestions are there to design and selection of teaching methods must take into account not only the nature of the subject matter but also how students learn. In today's school the trend is that it encourages a lot of creativity. It is a known fact that human advancement comes through reasoning. This reasoning and original thought enhances creativity.

Many professional disciplines, including nursing, medicine, teaching and law use case studies as a means of teaching and learning (Kim et al., 2006)^[6]. Case studies are effective in assisting students to develop critical thinking, enhance problem solving skills and facilitating learning through scenarios that mimic real life situations (Burbah et al., 2004; Kunselman and Johnson, 2004; Mayo, 2004)^[7,8]. The process of participating in a case study facilitated in a high fidelity simulated clinical setting challenges learners to critically analyze problems and make decisions in a

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changing environment, often with limited or conflicting information. This type of learning encourages learners to build on the knowledge they have, use clinical data, patient views and responses and create a diagnosis or picture of a situation (Kim et al., 2006)^[9]. Additionally, this type of learning allows students to progress according to their level of knowledge (West et al., 2012)^[10] as case studies can be used at any year level in an undergraduate nursing program.

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3. Review of Literature

For the present study an extensive review of research and non-research literature relevant to the study was undertaken to develop deeper insight into the problem and to build the foundation of the study. Out of that, a few literature information which are thought to be supportive to the study focus, are presented here under the following sub-headings:-

- Review of Literature related to case study
- Review of Literature related to Chest Physiotherapy

William. M.M. conducted a study on student's reaction to case study presentation was assessed by conducting a survey on 90 undergraduate students on Neuroscience course. Prior to the survey the students were asked to conduct case studies on different cases and to present for 20 minutes in class. The students were asked to rate their agreements (Strongly agree, Agree, No opinion, Disagree and strongly disagree). The survey comprised of two open ended questions to tell what the students did like and did not like about the case study. The survey showed that, all the students indicated the case study assignments were a valuable learning experience and that improve their knowledge and interest in the subject. The result of the open ended questions revealed that the reason for liking the case study assignment. The students responded that they liked case study because they got in depth knowledge, opportunity to learn about case study, and also got opportunity to learn from case Study presentation of other students. The difficulty in obtaining and funding research sources, the time consuming nature, length of the assignment, difficulty in designing the experiments and conducting the class presentation were reasons that the students did not like in the case study^[11].

Bonney, Kevin conducted a study on Case Study Teaching Method Improves Student Performance and Perceptions of Learning Gains at Kingsborough Community College, New York, To evaluate the effectiveness of the case study teaching method at promoting learning, student performance on examination questions related to material covered by case studies was compared with performance on questions that covered material addressed through classroom discussions and textbook reading. Total 56 students were included in the study, 23 (41%) were male and 33 (59%) were female. The four biological concepts assessed during this study (chemical bonds, osmosis and diffusion, mitosis and meiosis, and DNA structure and replication) were selected

as topics for studying the effectiveness of case study teaching. Assessment scores were collected from regularly scheduled course examinations. All assessment questions were scored using a standardized, pre-determined rubric. Each of the four case studies resulted in an increase in examination performance compared with control questions that was statistically significant, with an average difference of 18%. The mean score on case study-related questions was 73% for the chemical bonds case study, 79% for osmosis and diffusion, 76% for mitosis and meiosis, and 70% for DNA structure and replication This finding was positively correlated to increased student perceptions of learning gains associated with oral and written communication skills and the ability to recognize connections between biological concepts and other aspects of life. Based on these findings, case studies should be considered as a preferred method for teaching about a variety of concepts in science courses.^[12]

Clint J. newstead et.al (June 2017) conducted a study at Australian Critical care Nursing Professionals' attitudes towards the use of "Chest Physiotherapy" technique. A total of 1222 members of the Australian college of critical care nurses were invited to participate in an anonymous online survey. There were 142 respondent (12%) with the majority (n=132, 93%) having performed chest physiotherapy in clinical practice. Most of them considered that chest physiotherapy was a part of nurse's role. The conclusion of their study was that nurses' working in critical care commonly utilized traditional chest physiotherapy technique.^[13]

Purpose

The purpose of this study is to evaluate the effectiveness of case study as a teaching strategy for UG nursing students regarding chest physiotherapy

Objective

To assess the effectiveness of teaching chest physiotherapy using Case Study methods, on the level of knowledge & skill of UG Nursing Students.

Hypothesis

Hypothesis: will be tested at 0.05 level of significance

H1 There will be a significant difference between the mean pre test & post test scores of UG nursing students regarding chest physiotherapy in term of Student's knowledge & skill.

H0 There will be no significant difference between the mean pre test & post test scores of UG nursing students regarding chest physiotherapy in term of Student's knowledge & skill.

4. Methodology

Design and Sample

A quasi-experimental pre- and post test design was used to evaluate the effectiveness of case study teaching method among B.Sc. Nursing first year students (N=55) of selected nursing institution of Utrakhand, who were enrolled in year 2017-18, regarding chest physiotherapy. The study was conducted in selected nursing college of Dehradun, Uttarakhand. Total enumeration sampling technique was used for data collection. But 5 students were absent during pre test and teaching program, they were excluded from the study. So the data was analyzed for 50 students.

Data Collection Tools

Based on the objectives and the conceptual framework of the study, the following instruments were developed in order to generate the data:-

Personal information of students

Personal profiles of students contained 5 items which included code no, Age in years, Gender, education, marital status, and have attended any class/ workshop/ seminar on case study method of teaching regarding chest physiotherapy. There was no scoring for personal information.

Structured knowledge questionnaire

Twenty five objective type questions were prepared for assessing the knowledge of nursing students on chest physiotherapy. In planning the structured knowledge questionnaire, the purpose, general objectives, specific objectives & specific content area were outlined. There are two dimensions i.e. objectives & content. The objectives depicted the domain of testing i.e. Recall, comprehension and application. The content details included the major areas for assessing the knowledge of subjects, each item was given a score of one so that maximum score of the structured knowledge questionnaire was 25.

Validity & reliability

For content validity the tool was submitted to 5 experts. The Kuder Richardson (KR - 20) was used to calculate the reliability coefficient, the value of 'r' was found to be 0.929.

Structured observational checklists

Dichotomous observational checklists were developed after extensive review of literature with two alternative response columns: done and not done. Scoring of observational checklists was by observing the procedure done by the students either 1 if steps of procedure done or 0 if steps of procedure not done. Total steps included into checklist were 19 and the total score of checklist ranged from 0 to 19.

Validity & Reliability

For content validity the tool was submitted to 5 experts, requested to judge the items on the basis of their relevance, clarity, feasibility, appropriateness and organization of items

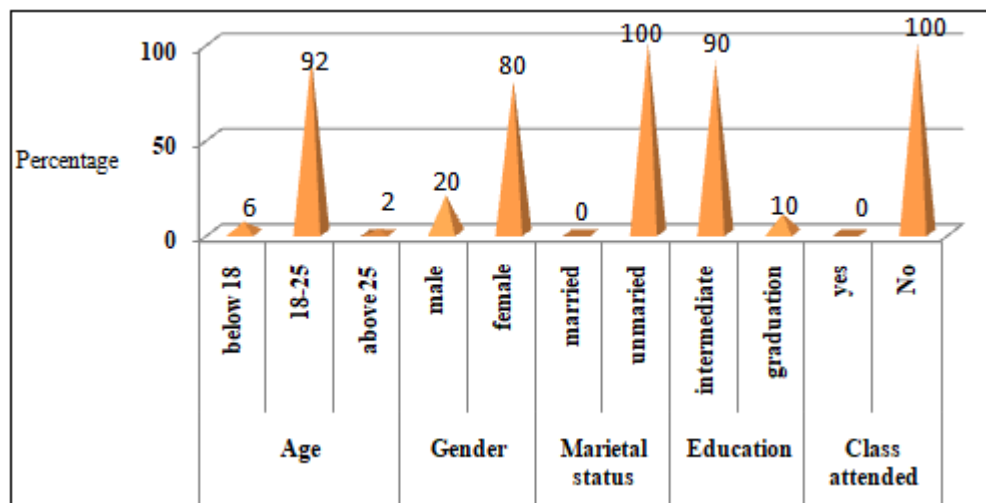
included in the study. Inter rater reliability method (single event and three observer) was used to calculate the reliability coefficient of the structured observational checklist. The value of 'r' was found to be 0.94.

Data Collection Technique & Procedure

After obtaining formal administrative permission, the selected subjects were explained about the purpose and usefulness of the study and assurance about the confidentiality of their response, a written consent from the participants in the study was obtained. After taking pretest of knowledge & skill Students were divided into small group of 10 students in each group, so that five small groups were made, and taken to the clinical setting. Valedictory session was organized after the completion of teaching on chest physiotherapy using Case Study method. After seven days of taking pretest, post test of knowledge, and skills were assessed and analyzed.

5. Data Analysis & Interpretation**Section I: Frequency and Percentage Distribution of Sample by Their Personal Information****Table 1:** Frequency and Percentage Distribution of Sample by Their Personal Information

Variables		Frequency	Percentage (%)	Total Percentage (%)
Age in Years	Below 18	3	6	100
	18-25	46	92	
	25 above	1	2	
Gender	Male	10	20	100
	Female	40	80	
Marital status	Married	0	0	100
	Unmarried	50	100	
Educational status	Intermediate	45	90	100
	Graduate	5	10	
have attended any class/ workshop/ seminar on case study	Yes	0	0	100
	No	50	100	

**Figure 1:** Percentage Distribution of Sample of by their Personal Information

Data presented in table 1 shows that- In relation to their age all 3(6%) nursing students were below 18 years of age, 46(92%) were between 18-25 years of age only 1(2%) were above 25 years of age. As regard to gender 40 sample subject maximum nursing students 80% were female and only 10 sample 20% were male. In relation to their marital status all 50 nursing students 100% were unmarried. In relation to their qualification 45 nursing students 90% were intermediate passed, only 5 (10%) were graduate. In relation to their marital status all 50 nursing students 100% were unmarried. All the nursing students have not attended any class/ workshop/ seminar on case study teaching method.

Section-II: Pre test & post test level of Knowledge and Skill of nursing students regarding chest physiotherapy

Table 2: Pre test & post test mean, mean percentage & standard deviation of Knowledge and Skill of nursing students regarding chest physiotherapy

Variables		No. of items	Max. score	Mean	Mean%	S.D
Knowledge score	Pre test	25	25	11.2	44.8%	11.50
	Post test	25	25	20.7	82.8%	8.06
Skill score	Pre test	19	19	2.88	15.1	3.7
	Post test	19	19	16.84	88.63	5.37

Data presented in Table 2 depicts pre-test and post test level of knowledge & skill among nursing students regarding chest physiotherapy. The pre test & post test Mean±SD of scores was found to be 11.2(44.8%) ± 11.50, 20.7(82.8%) ± 8.06 in term of Knowledge & the pre test & post test Mean±SD of scores was found to be 2.88(15.1%) ± 3.7, 16.84(88.63%) ± 5.37 in term of skill.

Section-III : Assess the efficacy of case study method by comparing pre test & post test knowledge & skill level of UG Nursing Students regarding chest physiotherapy.

Table 3: Comparison of pre test & post test knowledge & skill score of UG Nursing Students regarding chest physiotherapy

Variables	Pre-test	Post-test	Mean difference	t-value	Inference
	Mean± SD	Mean± SD			
Knowledge score	11.2±11.50	20.7±8.06	9.5	4.42	S
Skill score	2.88±3.7	16.84±5.37	13.26	4.14	S

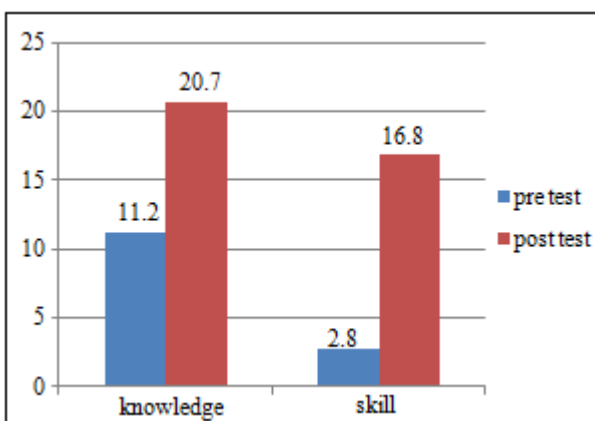


Figure 2: Comparison of pre test & post test knowledge & skill score

The study was to test the efficacy of case study method on knowledge and skill of UG nursing students regarding chest physiotherapy. pre-test and post test Mean±SD for knowledge is 11.2± 11.50, 20.7±8.06 & the pre test & post test Mean±SD in term of skill was 2.88± 3.7, 16.84±5.37, “t” value for knowledge & skill was 4.42 & 4.14, which shows a significance improvement in term of knowledge & skill, which indicate that case study is highly effective teaching strategy for nursing students.

6. Discussion

The discussion is organized in relation to the objectives and findings of the study

To assess the efficacy of case study method on knowledge and skill of UG nursing students regarding chest physiotherapy

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Findings of the study are supported by Bonney, Kevin conducted a study on Case Study Teaching Method Improves Student Performance and Perceptions of Learning Gains at Kingsborough Community College, New York, To evaluate the effectiveness of the case study teaching method at promoting learning, student performance on examination questions related to material covered by case studies was compared with performance on questions that covered material addressed through classroom discussions and textbook reading..Total 56 students were included in the study, 23 (41%) were male and 33 (59%) were female. The four biological concepts assessed during this study (chemical bonds, osmosis and diffusion, mitosis and meiosis, and DNA structure and replication) were selected as topics for studying the effectiveness of case study teaching. Assessment scores were collected from regularly scheduled course examinations. All assessment questions were scored using a standardized, pre-determined rubric. Each of the four case studies resulted in an increase in examination performance compared with control questions that was statistically significant, with an average difference of 18%. The mean score on case study-related questions was 73% for the chemical bonds case study, 79% for osmosis and diffusion, 76% for mitosis and meiosis, and 70% for DNA structure and replication This finding was positively correlated to increased student perceptions of learning gains associated with oral and written communication skills and the ability to recognize connections between biological concepts and other aspects of life. Based on these findings, case studies should be considered as a preferred method for teaching about a variety of concepts in science courses.²⁵

7. Conclusion

The purpose of the investigation was to assess the efficacy of case study method on knowledge and skill of UG nursing students regarding chest physiotherapy. Findings of this study concluded that case study is an effective teaching strategy to improve knowledge and skill of nursing students. The use of case study method as a teaching strategy is essential to stimulate students to seek knowledge and improve clinical skills future in their professional lives. This method focus on students, therefore, it is necessary their active participation in the search for knowledge and in development of their skills. Teaching strategies can engage students in an active learning process. If they use these strategies well, nursing students are more likely to memorize the information associated with the lesson. It is important for nurse educators to select appropriate teaching strategies in order to deliver high-quality education.

8. Recommendations

On the basis of findings of the study, the following recommendations are offered for future research.

A similar study can be conducted by adopting true experimental research approach with pre test- post test control group design and on a larger sample groups.

Senior courses students need to be taught the actual utilization of teaching methods, appropriate to their practice teaching topics and level of students they are assigned to teach.

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