

Research Article

The Introduction of Problem-Based Learning in Nursing Education: An Implantation Project

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Abstract

Background: Nursing education in healthcare is one of the significant aspects that have been gained huge attention among practitioners and educational faculties, where Learning method holds paramount importance in reaching the desired objective. Lecture-based learning has been implemented in nearly all institutions including nurses' colleges, According to many new types of research, this system of learning is not suitable due to its inflexibility and the fact that it is instructor centered. On the other hand, problem-based learning is more flexible and goal oriented.

Methods: This research has used Health Service model, the change is introduced in nursing education activities, considering problem-based training. Furthermore, Kirkpatrick model has been implemented as a design strategy. The survey questionnaire was distributed among maternity unit nurses, pre-test and post-test, and critical thinking case study introduced. A total number of 24 mixed skill level nurses participated.

Results: The findings show the effectiveness of using the problem-based learning as an instructional approach, increase knowledge level, improves problem-solving and improve the critical thinking skills, and the self-directed learning.

Conclusion: The project is integrated with pain management team that give strength to the program. The results open another concept, the difference between employee learner and the academic learner. Furthermore, it saves the turnover cost of the nurses as well as the cost of patient's services along with reduction in working hours as well as cost efficiency.

Keywords: *Problem-based learning; Nursing Education; Health Service Model; Implementation Project; Problem-solving.*

Introduction

The information and data in medical science are increasing rapidly in a relatively shorter period of time; therefore, hospital teaching and educating staff must consider new teaching strategies in order to meet the challenging demand in new health care organizations [1,2]. In nursing education, the information of pain management is provided mainly through patient simulators, lecture-based training, or didactic teaching. Previous report showed that many colleges and universities use patient simulators for teaching pain assessment and other psychomotor skills [3] however, this method has a drawback that it is only considered at doctoral and master's level programs. On the other hands, using lecturing method, which is the most commonly utilized teaching method in nearly all institutions, was reported to be ineffective method in meeting the needs of modern pain assessment and management, as those are based on various complex details that are needed to exhibit. Thus, a change in the traditional teaching methods is needed to meet both learner and educator's needs.

Problem-based learning (PBL) is defined as "a student-center in which students learn about a subject through the experience of problem-solving" [4]. PBL is an instructional approach that has been used successfully for over 40 years and continues to gain acceptance in multiple disciplines; it empowers learners to integrate theory and practice and apply knowledge and skills to develop a viable solution to a defined problem [5]. Since its introduction in the late 1960s at Mc Master University Medical School by Howard S. Barrows, PBL approach has been adopted in many medical schools across North America and Europe [5].

There is a growing body of evidence reports the effectiveness of PBL in nursing educational program, Nasir explored the effectiveness of using PBL at the point of clinically based and found that PBL helps the learners in a better understanding of prior knowledge, improvement in their problem-solving skills, and makes them self-learner [6]. Similarly, Preeti found improvement in knowledge acquisition in medical teaching when PBL is used as an educational strategy [7]. Moreover, PBL in organizations is an essential component as it has a great impact towards learning and staff performance. PBL was reported to add to the nurse's competencies, which would reflect in the nurse's performance and the organization outcome [5]. Staff engagement and involvement has effective impact on staff satisfaction and retention rate.

In present study, we used an action research approach to assess, implement, and evaluate the introduction of a PBL as an instructional approach for professional nurses' educational programs. In addition, we aimed to motivate professional nurses to improve their knowledge tradition and to develop generic skills that help effectively to solve a clinical problem.

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Methodology

I. Ethical Statement: The rules, laws, and codes of conduct consider the permission from the nursing administration and hospital director were reviewed for conducting the research. We filled the University Students Application to Conduct Research in DHA and submitted it to the Central Ethics Committee (DSREC) for ethical approval.

II. Change Process Model: We used the Health Service (HSE) as a model of change; because of its feasibility and applicability to the training field and health service. HSE has been developed to improve the experience of patients, to help staff to play a meaningful role in improving services and to promote a consistent approach to change; it focuses on compelling and clearly articulated shared vision of integrated health and social care service delivery. Furthermore, it is effective in the utilization of resources to support the change process.

A. Initiating: In the first stage, we assessed the current situation to identify the gap in nursing education and the need for the new teaching method. The change design tool SWOT and risk analysis were used to identify the change drivers and stakeholder who would be affected by the change in the organization. The initial objective was outlines to introduce the PBL and identify the outcomes from the training using the PBL.

B. Planning: We framed the commitment to introduce the change in the educational program with the new teaching method. The groups identified, and who will be involved in the change process to be selected after approval. The Gant chart and communication plan were developed as well.

C. Implementation: Project Implementation plan was created and the pain management program was planned. The resources and the team were assessed for the cost and the time during the process, and the quality of teaching material was evaluated to ensure meeting the objectives]

D. Monitoring: We used the reflective diary to assess and examine the performance against the objectives, monitor the efficient use of material, the cost, and the effort of facilitators. We identified corrective actions if needed for any unexpected obstacles and finalized outstanding work.

III. Evaluation Model: To evaluate the effectiveness of training and education, the Kirkpatrick model was utilized as a standard of measurement. The Kirkpatrick model consists of four levels which reflect the value and significance of formal and informal education and training across all the levels. This model can be applied to the training, after as well as during the education and training demonstration in the organizations [8].

The four levels of Kirkpatrick model were: 1) Reaction: the evaluation based on the views of participants to discover the favorable outcome, engagement, and relevance to the job; 2) Learning: the evaluation based on the views of participants to what extent they attain the planned knowledge; develop skills, confidence, and attitude. It also evaluates the commitment of learners to participate in training sessions; 3) Behavior: the evaluation is done on the basis of applying the procedures that are learned during training in practice when participants are back on their job; and 4) Results: the evaluation on the basis of the outcomes delivered as a result of training and education.

IV. Data collection: The data collection tools included the modified PBL Change Project questionnaire which was 5-likret scale questionnaire measuring the satisfaction of participants with their PBL experience; the questionnaire was published and validated elsewhere [7,9]. Critical thinking exercises and knowledge test were also collected (Appendix.1). We included volunteers from nursing staff; 24 nurses appeared for the two days program of PBL pain

However, only 5% were just satisfied with the implementation of PBL approach for bringing change in the healthcare setting (Figure 1). While 84% nurses were reported to develop problem-solving skills, 85% reported with improved communication skills, 86% nurses have developed critical thinking skills, 87% of the nurses have developed self-directed learning skills and basic science knowledge, and 84% have developed the integration of basic and clinical knowledge and facilitation skills (Table 1).

The results show that before the implementation of PBL the was reported to be 53% while the test scores after the implementation of PBL were reported to be 80% which are more than the previous scores (Figure 2). Seventy-five percent improvement was reported in analysis skills and evaluation skills while 65% improvement was found in deduction skills and 60% improvement was seen in induction skills (Table.1). A focus group conducted to collect data about, Participant’s feedback to assess the effectiveness of PBL and its applicability to the hospital clinical area, to identify nurse’s views to use this PBL in all educational programs. The question was “describe your experience with problem-based learning”.

The answers came out with different observations, some with a positive and some with a negative view. Some Participant not comfortable for PBL timing, they believe they need time since they have to prepare for the presentation from different sources during their family time. One participant said” training with PBL good for collecting and sharing ideas to other but need a follow-up on and more guidance on the focus of the topic.”



Figure 1: Overall Percentage of staff Satisfaction of Problem-Based Learning.

Table 1: Percentage distribution of staff satisfaction.

Items	Percentage
Problem-Solving Skills	84%
Communication Skills	85%
Critical Thinking Skills	86%
Self-Directed Learning	87%
Basic Science Knowledge	87%
Integration of basic and clinical knowledge	84%
Facilitation Skills	84%
Analysis	75%
Evaluation	75%
Deduction	65%
Induction	60%

management. Selection criteria were random, as there was a PBL presentation during general nursing journal club meeting included 39 staff attended, and only 24 agreed to participate.

Results

I. Results Based on Application of Kirkpatrick Evaluation Model

The results show that 34% nurses were highly satisfied with the PBL approach while in the opinion of 61%, this approach is very good.

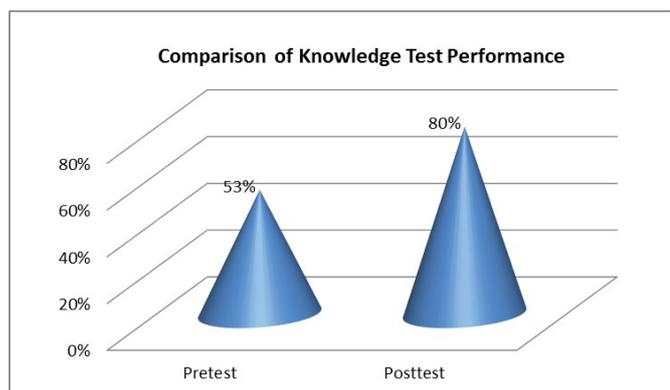


Figure 2: Comparison of Knowledge Test Performance.

Another participant was very excited and comfortable to get the chance to be involved in this program; she said: “PBL motivate me to use the e-library to answer patients enquires, I feel more confident to stand and present knowledge that I gain.”

Discussion

Change project has been proposed in the current study to suggest the importance of developing critical thinking and problem-solving skills in the nursing staff. The author uses the HSE model and plays the role of change agent, initiate the change by the assessment of the current situation that drives the need for change, based on this needs the project planned to introduce an instructional method which is evidence based used successfully. It has been observed while conducting the study; critical thinking that is using one’s intelligence for identifying the patient’s problems, examining the evidence-based clinical and care practices and selecting the method of delivery of care has been developed in nurses. The nurse has started conducting the clinical reasoning based on problem-solving among real clinical cases either by simulations or the patients of the hospital.

The significance of the project can be seen as nurses were able to suggest strategies for gathering and analysing patient medical information and evaluating the medical records. Outcomes show that improved and effective nursing practices are observed in the healthcare setting based on evaluation by Kirkpatrick model. Researches show that effective nursing practices based on PBL and critical thinking result in patients’ physiological and psychosocial positive outcomes. This concept was progressed from the study of Simmons in 2010 on the evolution of decision making by healthcare professionals [10].

Many of the successful healthcare systems have implemented the dynamic and effective methods including PBL and learning through simulations. Studies show that PBL assures that learning by practical means is significant as it generates interest, a better understanding of the subject and can be implemented as modern day strategy for teaching to improve the attainment of knowledge in Medical technology [7,9].

On the other hand, a study suggested that teaching through PBL require interaction by teachers with their student instead of merely the conveying the information at the level of meta-cognition. Clinical reasoning, questioning must be integrated to develop the satisfaction factor in learners. The teacher must present a role of co-learner, facilitator and guide to developing PBL methodologies to overcome the challenges faced during class [11]. Furthermore, this approach demands participation, concentration, attention, collaboration and planning by the learners to make decisions based on reasoning and critical thinking [7].

Hence, the results of this project reveal higher satisfaction among the nurses by implementing and evaluating PBL method for training and education.

A study of Elizabeth Rideout on comparing the PBL with the conventional method in nursing education department was analyzed. The study concluded that there is an association among educational and teaching methodologies and the learning outcomes of students. Hence, the study suggested the fact that PBL can be implemented as an effective and significant approach to educate nurses. Moreover, high satisfaction resulted with the application of PBL programs in educating nurses [12].

However, a study by Prince revealed that in PBL, students score low in the science related examination. The study further analyzed that in the view of student they are not well prepared for PBL as they were conventionally trained by traditional learning methodologies [13]. Another study conducted also reveal that in PBL students are inclined towards backwards reasoning instead of forwarding reasoning. Gaps are also highlighted in the attainment of knowledge by cognition in comparing the outcomes of the clinical practices [14].

Hence, the results of this project reveal that nurses test scores were higher after the implementation of PBL method.

Alias Masek conducted a critical analysis on the effects of PBL approach. As discussed by the author, PBL has always been supported by empirical studies and previous literature. Therefore, many findings have found conflicting reviews about PBL approach. Many authors supported to implement the PBL considering its long-term benefits in the healthcare setting while in the view of some authors no great influence has been seen from the PBL implementation. The study of Alias has reviewed and investigated many theoretical associations between effects of PBL and generating critical thinking ability in the students [15].

However, a critique was made by Kenneth that although literature supports the positive association of PBL and critical thinking in the healthcare setting regarding nursing students yet there is a need to review the studies that examine the effects of PBL on critical thinking. According to the researcher, nursing educators must continue to utilise the traditional methods for clinical training and education in nursing [16].

Hence, the conducted study on the nursing department of Hospital reveals that improvement rate among nurses after implementing PBL methodology for learning has increased critical thinking in nurses. 75% improvement was reported in analysis skills and evaluation skills while 65% improvement was found in deduction skills and 60% improvement was seen in induction skills.

In this study, the sustainability of the nursing education is maintained by considering the goal of education as sustainable development of nurses in the healthcare setting by implementing PBL approach. PBL deliver benefits in long term aspect for training and education [17]. PBL learning develops sustainable competencies in nurses of healthcare setting by incorporating critical thinking and clinical reasoning in nursing of the author Hospital.

The overall percentage of staff satisfaction of PBL method was positive as the PBL method is the most effective and efficient way for teaching nursing staff. The majority of the learners find this method satisfying as well as enjoyable. Also, it encourages the greatest understanding and helps in creating environment sustainable. It has been seen widely that students with PBL experience rate their abilities higher.

Furthermore, PBL method helps in developing lifelong learning skills. Short-term outcomes can be directly tied to the rate of nursing satisfaction from the new teaching method and the changes in nurse’s knowledge and skills level. The impacts of these changes in the organization considered as long-term outcomes [18]. PBL method helped the learners in determining the gaps in their knowledge and

improved their performance of the group functioning as well as general skills. The PBL method is essential for optimizing the training of the health care organizations [19].

Comparison of knowledge test performance through pre-test and post-test were clear which indicates that the PBL method enhances the knowledge level as PBL method analyze the problem instead of providing lecture. It boosts the knowledge skills through examining what an individual knows as well as it discovers what the learners need to learn. It helps in enhancing communication skills, and overall performance in terms of teaching nursing education, PBL can be an effective approach in nursing education. The study shows high learner satisfaction from using PBL although no difference in the students' baseline knowledge, there were significant differences in the mean score of knowledge.

It has been observed that majority of the organizations are utilizing PBL method as it is the most convenient and effective way for teaching problems [20]. The outcomes can be directly tied to the rate of nursing satisfaction from the new teaching method and the changes in nurse's knowledge and skills level [7]. The impacts of these changes in the organization considered as Long-term outcomes. When an organization invests in nursing education as it generates a high-quality outcome that most likely meets client's expectations in order to raise the staff rate as well as the satisfaction of the customers. It maintains the competitive position among diverse health care sectors within the area.

Hence, it has been observed that at Hospital, clinical and care practices of nursing were improved which in turn were beneficial for the patient's recovery.

The main limitation is the time, this study was conducted in a limited time manner, so the desired outcomes did not fully achieve for developing the generic skills within the time frame.

The subject also lacks in variables; there should be involvement of some other variables to derive results more clear such as profitability, atmosphere, company size, etc., which provides noteworthy consequences. The sample size, which is the most important factor to be considered as the entire research study efficacy and validity depends on the sample size, there is the limitation in the sample size that was not potential to derive the clear results.

There is a lack of resources in conducting this research study as the subject is very much elusive, as for allowing in mind only a single aspect such as particular location or country was problematic. Lastly, the participants were employed as a nursing staff, not an academic student, and as a volunteer join the program, the author has no control on the sample behavior or commitment to the study.

- Recommendations for Future Steps

The research suggested that the nursing educators need to implement PBL method for teaching as well as maintain a high level of coordination with their internal and external employees that can help them in achieving a high level of sustainability in the industry. Furthermore, it also leads them to overcome their errors and concerns through better communication and with the assistance of Kirkpatrick Evaluation Model among them.

- Implications for practice and further study

It is also revealed from the current study that the implementation of the PBL method can bring positive change in the organizational and employees performances.

In addition, the majority of the caregivers believe that Kirkpatrick evaluation model affects positively and it is mandatory for organizational success. It has been recommended for the future research options that the researcher must focus on a specific

organization that would allow him to assess the diverse effects of PBL in different situations. Furthermore, the researcher can examine different evaluation models such as CIPP evaluation model, Conceptual model for evaluation of continuing nursing and LOGIC model etc. will provide the in-depth and broad view of the effectiveness of these models and the ways that how organizations can take advantage from these models and enhance their process of learning and improve their teaching methods.

Author's Conclusion

Facts revealed a gap in nursing education, mainly in the teaching method that currently used. Literature shows that PBL is an effective way for delivering nursing education in a coherent, integrated program, and offers several advantages over traditional teaching methods. It is based on principles of constructive learning theory, develop critical thinking and problem-solving skills, enhance engagements and motivating the learner, encouraging them to set their own learning goals, and giving them a role in decisions that affect their own learning.

Even though, it has several well recognized-disadvantages. Traditional knowledge-based assessments of curriculum outcomes have shown little or no difference in learner graduating from PBL or traditional curriculums. Importantly, though, learners from PBL curriculums seem to have better knowledge retention. PBL also generates a more stimulating and challenging educational environment, and the beneficial effects of the generic attributes acquired through PBL should not be underestimated.

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