

Use of Problem Based Scenarios to Prepare Nursing Students to Address Quality Improvement in Health Care Unit: North West University Experience

Mahlasela Annah Rakhudu

*Department of Nursing Sciences, North-West University (Mafikeng Campus),
Mmabatho, South Africa
Telephone: 27183892530/2466, E-mail: hunadi.rakhudu@nwu.ac.za*

KEYWORDS Problem Based Learning. Students. Quality Improvement. Health Care. Nursing Education

ABSTRACT Preparation for quality health care must begin in the basic education and should be integrated in the clinical education to be more meaningful. The aim of the study is to explore and describe the opinions of nursing students regarding the use of PBL scenario in addressing quality improvement in the health care unit; Problem based scenario was used to address quality improvement at unit level for the level 4 nursing students and followed collaborative assessment after placement in the clinical services for four weeks preparing for quality inspection. Sequential explorative mixed method was used. Purposive sampling was used to recruit the participants in the qualitative component and convenient sampling in quantitative strand. Ethical clearance was obtained from NWU ethics committee (Ethics No. NWU-00033-11-A9) and permission to conduct the study was obtained from North West Provincial Health Department. Themes that emerged from the interviews included: empowerment from Problem Based Learning (PBL) scenario and clinical project; preparedness to address quality improvement in clinical setting; contribution to the unit readiness for quality improvement; and strengthening of inter-institutional and interdisciplinary collaborations. PBL scenarios are very effective teaching quality improvement and in closing the theoretical and clinical learning gaps and collaboration in assessment of students benefit students.

INTRODUCTION

Internationally, leaders in government, the private sector, and education agree that the entire nursing educational system is in need of reform. The driving force behind this reform is the realization that successful employment and citizenship require different knowledge and skills than in the past (Duch et al.1998; Demiris and Zierler 2010; Du et al. 2013; Kong et al. 2014). Thus, in addition to their traditional role as purveyors of discipline of a specific knowledge, nurse educators are being urged to adopt classroom methods that help students to develop the competencies identified as necessary for success including, the ability to: 1) Critically think, analyse and solve complex real world problems; 2) find, evaluate and use appropriate learning resources and evidence for best clinical practices; 3) work cooperatively in teams and small groups; 4) demonstrate effective verbal and written communication; and 5) use content knowledge and intellectual skills to become life-long learners.

PBL provides an environment for promoting these skills (Duch et al. 1998; Rideout 2001; Tompkins 2001; Demiris and Zierler 2010; Du et al. 2013; Kong et al. 2014). PBL is an educational approach that organizes curriculum and instruction around

carefully crafted “ill-structured” problems. Students gather and apply knowledge from multiple disciplines in their quest for solutions. Guided by teachers acting as cognitive coaches, they develop critical thinking, problem solving, and collaborative skills as they identify problems, formulate hypotheses, conduct data searches, perform experiments, formulate solutions and determine the best “fit of solutions to the conditions of the problem” (Haith-Cooper 2000). Problem-based Learning enables students to embrace complexity, find relevance and joy in their learning, and enhance their capacity for creative and responsible real-world problem-solving (Haith-Cooper 2000; Delva et al. 2000; Luo et al. 2014).

This approach in contrast to a traditional teacher centred approach wherein the key facts and concepts are presented to the students with PBL the students engage in self-directed learning. Alessio (2004) identified the following key features: 1) Learning in context, where real life problems are presented; 2) elaboration of knowledge through social interaction, where the students work together in small groups; and 3) meta-cognitive reasoning and self-directed learning with independent thinking and long-life learning. In the process of solving problems, students develop knowledge of theory, prac-

tice and facts, concepts and appropriate inquiry strategies related to the initial problem. The interactive nature of PBL, which encourages students to consider a variety of potential solutions to relevant scenarios, makes this strategy a valuable instructional tool for Department of Nursing Sciences.

Having adopted PBL, the Department of Nursing Sciences (DNS) at North-West University (NWU) a paradigm shift was required for assessments in undergraduate education and emphasise valid assessments in PBL. Thus, the need for assessment of learning following use of PBL scenarios based on the opinions of students as consumers and client of nursing education is important.

Purpose

The purpose of this sequential explorative research study was to explore the opinions of the nursing students regarding the use of PBL scenario in addressing quality improvement (QI) in nursing education. The variables of interest included reaction to the PBL scenario, learning, behaviour and results of the use of the PBL scenario in addressing QI in nursing education. Specifically, this study aimed at finding answers to the following questions: -

1. What was your initial reaction or response to PBL scenario in addressing QI in nursing education? Alternatively describe your feelings regarding the use of PBL scenario to address QI in nursing education.
2. What is your opinion regarding the effect of PBL scenario to your learning of QI? Alternatively explain how you learned QI in nursing through the use of PBL scenario.
3. What is your opinion regarding relevance of the PBL scenario on QI in the clinical area where you placed throughout your education and training? Alternatively explain the relevance of the PBL scenario to nursing practice.

4. How could the PBL scenario in addressing QI be changed to improve effective learning and evaluation? Alternatively suggest how the Department of Nursing can improve the use of PBL scenario to address QI for effective learning.

Significance of the Study

The study was considered significant to the Department of Nursing Science management and staff, because it may provide basis evaluation of the effectiveness of instructional modalities and taking corrective measures where necessary. The study will also provide evidence based practice.

Framework

The Kirkpatrick Model of Evaluation was adopted as framework to guide the decisions to be taken about data collection, data analysis and data review, how data were understood and critiqued. Kirkpatrick’s model of evaluation provided the framework for this study. By approaching evaluation from four different perspectives, namely; reaction, learning, behaviour, and results—the model has provided a solid basis for the examination of the impact of use of PBL scenarios on the Nursing education at North-West University (NWU). The Kirkpatrick model of evaluation (Kirkpatrick and Kirkpatrick 2006) proposes four levels of evaluating a program such as an educational activity: reaction, learning, behaviour, and results. Kirkpatrick’s evaluation levels are sequential but not rank ordered in importance or value. Table 1 depicts Kirkpatrick’s model of evaluation.

METHODOLOGY

The study was conducted in two phases, namely; use of PBL scenario to address quality improvement in health care and exploration and

Table 1: Donald Kirkpatrick’s framework for evaluation

<i>Level</i>	<i>Evaluation type</i>	<i>Evaluation description and characteristics</i>
1	Reaction	Reaction evaluation is how the students felt about the training or learning experience.
2	Learning	Learning evaluation is the measurement of the increase in knowledge - before and after.
3	Behaviour	Behaviour evaluation is the extent of applied learning in a working situation - implementation.
	Results	Results evaluation is the effect on the business or environment by the trainee.

description of the nursing students' opinions regarding the use of scenario in addressing quality improvement,

Phase 1: The student were given this scenario; "Ward B in Kokelong District Hospital is characterised by complaints from the multi-disciplinary team members, students, patients and community members". The students went through the following triple jump steps of PBL process:

1. Problem statement and analysis through brain storming to produce many different explanations for the phenomena. Prior knowledge and common sense was used. The students also discussed and criticised explanations proposed to try to produce coherent descriptions underlying the problem or events from this fact finding step.
2. Formulation of learning issues for self-directed learning. Amongst the learning issues was ineffective management and leadership and poor quality management and improvement and filled the knowledge gaps through self-study and preparation of quality visits in the units where they would be place for clinical learning for four weeks.
3. Sharing of their findings with the panel consisting of preceptors, university facilitators and professional staff from different units of the Hospital during quality improvement visit. The aim was for the groups of students to integrate the knowledge acquired into comprehensive explanation and application of quality improvement. The students' outcomes included restructuring, applying and problem solving of quality issues in the clinical services.

Phase 2: Phase 2 consisted of exploration and description of the students opinions regarding use of PBL scenarios in addressing quality improvement (QI) using a sequential explorative mixed method research design (Clark and Creswell 2007).

Study Design

An exploratory sequential mixed method design (MMD) was employed to collect data from three groups of 4th year nursing students was selected for the following reasons: 1) Combination of qualitative and quantitative components was essential to maintain rigour (Munhall 2012; Polit and Beck 2010); 2) This approach enhanced

descriptive and understanding of phenomenon (use of PBL scenarios to address quality improvement from the students' opinions; 3) The mixed method was used from the fact that neither a qualitative nor quantitative method is sufficient to capture details of the study situation (Clark and Creswell 2007); and 4) The results from two methods complement each other by enhancing, elaborating, illustrating a clarifying the results.

In this MMD the researcher commenced by conducting three (n=3) focus group discussions with students to obtain their opinions regarding use of PBL scenario followed by use of self-administered questionnaires (n=114). The themes identified through analysis of interviews were used to develop questionnaires that were sent participants (Schifferdecker and Reed 2009).

Sampling

The researchers purposively selected participants on the basis that those selected could provide the necessary data to contribute to understanding of phenomenon (Parahoo 2007). Inclusion criteria included inter-alia; nursing students registered with NWU for academic years 2011, 2012, 2013, for 4th year level of training and registered for the Nursing Management Module for the first time. An exclusion criterion was the students who were repeating the module. This was because those students experienced the use of the same scenario for the second time.

In the quantitative component convenience sampling was used to recruit students who participated in the quality improvement visit. One hundred and fourteen (n=114) completed the self-administered questionnaires.

Data Collection

In this study semi-structured focus group discussions were used to collect data from the three groups. The benefits of using focus group discussion on interview include richness of data and deeper insight into the phenomenon under study (Munhall 2013). Audio tapes were used to collect from participants. During quantitative components, a self-administered questionnaire was used to evaluate the students' opinions regarding the use of PBL scenarios in addressing quality improvement in nursing education. The significant variables evaluated were reaction,

learning, behaviour and results. Those were assessed on the Likert scale of 1-4 to indicate agreement with statements provided: 4=Strongly Agree, 3=Agree, 2=Disagree, 1=Strongly Disagree

Contest validity was checked with Department of Nursing Science lecturers. The tool was piloted with ten (10) participants from participating levels of training. Adjustments were made following the results of the pilot study.

Data Analysis

In the qualitative component, inductive process was followed and patterns and themes emerging from collected data was grouped following transcription from the audiotapes. Data was analysed thematically and inductively. A combination of open coding, then constant comparison of codes and collapsing of similar codes was used to reduce the data to a manageable size and to identify major categories and themes (Speziale and Carpenter 2007).

During quantitative components, the analysis of numeric data was carried out using SPSS version 21. Quantitative analyses included descriptive statistics.

Ethical Measures

Institutional ethical clearance (NWU-00033-11-A9)) was obtained to conduct the study, as well as permission from the clinical health authorities and students’ consent to participate. The questionnaires were completed voluntarily.

RESULTS AND DISCUSSION

Table 2 depicts the number of participants in both components of this study.

Three (3) focus group discussions (n=21) were conducted from different groups in the qualitative component followed by use of self-administration questionnaires from one hundred and fourteen (n=114) participants

Table 2: Participants in both qualitative and quantitative components

Qualitative	Quantitative	Total
FGD1(n=8); FGD2(n=6); FGD3(n=7) N=21	114	135

Demographic Data

The participants consisted of 117 females and 18 males. The maximum age was 47 years and the minimum age 21 years, with mean age = 22 SD= 3.98. The majority of participants (n= 106, 93%) had no prior experience in nursing, whilst n=8, (7%) had prior experience of nursing, namely, enrolled and auxiliary nursing background. All the participants never repeated a module during the period of training.

Table 3 depicts themes and sub-themes emerged from the interviews.

Theme 1: Initial Reaction or Response to PBL Scenario

The first question required the participants to reflect on their feelings after exposure to the PBL scenario on quality improvement. All students felt happy about the scenario as it reflected the situation they encountered regularly in the clinical situation. The quotes below depict how the participants felt.

“I felt so happy to see reality of ineffective quality improvement brought into the class, the scenario reminded us of the situations in our clinical areas. Truly, our health care services require a lot of improvement. The scenario gave me an opportunity to reflect how I would act as leader of such a unit. During information seeking, I learned, contributing factors to poor quality and what is to be done.”

“It was great for me to see the problems of the wards that I know addressed in the class in the form of scenario you actually ask yourself what could be done in such a case. We

Table 3: Themes and sub-themes from the interviews

Theme	Sub-theme
Initial reaction or response to PBL scenario	Happy to see clinical reality in class.Challenged to learn
The effect of PBL scenario to learning of QI	Empowered.Collaborative learningProblem solving
The relevance of the PBL scenario to nursing practice.	Team workInterdisciplinary and inter-institutional collaboration
How PBL scenarios could be improved for effective learning and evaluation	Shortening of the evaluation of outcomes of scenarioImprovement of evaluation

are nurse leaders and managers in the making. The scenario challenged us to look at our own behaviours regarding attitudes to our patients."

The results concur with the findings by Clark et al. (2013) who used PBL scenarios to address incivility wherein students reported that the scenarios offered opportunity to reflect on own situations and behaviours and learning how they might handle the situation. The students found the scenario to be authentic, bringing reality of quality issues and increased awareness of ineffective and its impact on the practice setting and patient care.

The results are corroborated by findings from the quantitative components where (n=120: 89%) who strongly agreed and (n=10: 7%) agreed whilst (n= 5; 3%) disagreed and that they were positively impressed with exposure to PBL scenario. students viewed the PB scenario as being realistic, relevant and aligned to clinical practice.

The participants reported that the scenarios challenged them especially that they had to plan learning and working as groups.

This is what one student verbalised

"After seeing the scenario, I immediately felt challenged especially when I thought of working with members of the group who were argumentative..... After the fact finding session and learning issues identification, I realised that the workload is going to be a challenge. To be honest PBL scenarios are very challenging."

"It is great to be given the scenarios, but it can be challenging too. The learning issues that emanate from the scenarios can be too much especially that it is not only nursing management that we had to learn. We also had Psychiatry, midwifery and research issues to do."

The result are corroborated by quantitative results wherein congruent with (n= 122; 90%) participants perceived PBL as challenging for the students in the beginning especially within groups. These views are congruent with assertions by Rideout (2001) that students perceive PBL as challenging in the beginning. The author further indicated that as students' progress in the programme; they learn to trust own abilities and in time work together and become responsible and accountable learners (Rideout 2001). Adapting to a PBL approach is a difficult experience (Carlisle and Ibbotson 2005), creating tensions during the process of changing from conservative or traditional method to PBL. PBL was found to be time-consuming and stress-

ful for Chinese students and faculty (Yuan et al. 2009). As Demiris and Zierler (2010) put it, PBL bears several challenges. Students when asked to review multiple sources in pursuit of answers, may feel challenged by the self-directed study and at times unsure what information is relevant and useful (Wood 2006).

Theme 2: The Effect of PBL Scenario to Learning of QI

Research Question 2 asked how the scenario helped students learn about dealing with QI in nursing practice. All participants commented that PBL scenario empowered not only in learning quality improvement process, but also in critical attributes such as collaborative learning and problem solving.

This is what one participant said:

"Going to look for information myself on quality assurance or quality management empowered me to understand better especially that the facilitator X will ask questions that does not require superficial reading. In class it is always required to elaborate on what you are saying or presenting. (Laughing from other participants and acknowledging by nodding their heads) This facilitator will always say can you unpack you statement? or can you explain in your own words or how do you understand that... especially when you try to refer to your written notes. You end up developing skills in information seeking and presenting skills you really had to be self-directed in information seeking or learning, think critically and have positive attitude. That is why I say PBL process is empowering."

The other verbalized this:

"Use of PBL helped us to learn collaboratively and not competitively, especially that this was a group work. We shared responsibilities and information, discussed together before presenting in class including the clinical project activities. It was unlike when I was to do it alone, I would like to outshine or outclass other student. There was surely collaborative learning."

The findings are congruent with the assertion by Tompkins (2001), Rideout (2000) and Koh et al. (2008) who perceived PBL as a teaching- learning strategy that develop the following attributes required in the 21st century graduate, namely, self-directed, problem solving and

teamwork player. The results concurs with the findings by Williams et al.(2012) where graduates indicated that the PBL programme helped them learn “where to go look” for information and “how to get it”. They learned how to “find good information” not just rely on what other people say PBL scenarios are effective in developing students for Critical Cross Field Outcomes CCFO’s) as prescribed by South African Qualification Authority (SAQA) 2005.

The scenario also prepared the students for management of quality improvement in the practice

This is a quote from one participant

“After working on the scenario, I believe most of us are ready to practice quality culture in our professional life. This was a 12 weeks exposure to quality improvement. We had to provide unit teaching sessions on various aspects of quality including record management because the scenario indicated messy record as an additional problem.”

The view is in line with result from the study by Williams et al. (2012) where PBL graduates indicated that they felt ready taking leadership roles within the health care team than some of the their traditional programme peer. PBL processes emphasize teamwork, strategizing, problem-solving and communication, thus readying students for leadership. PBL scenarios provide the students with the opportunity to encounter authentic health practice /situations as the initial stimulus and focus of their learning (Barrow 1998). The findings are complimented by quantitative results where (n=130; 97%) participants agreed whilst only (n=5: 3%) disagreed that the scenario readied them to lead and manage quality improvement in their professional career.

The results concur with the following documented positive outcomes of PBL: 1) self- directed learning (Rideout et al. 2002; Luo et al. 2014); 2) problem solving (Cooper and Carver 2012); 3)communication and decision making (Choi 2004; Uys et al. 2004); and 4) critical think-

ing (Tiwari et al. 2006; Yuan et al. 2008, Hwang and Jang, 2005; Spier et al. 2014).

Theme 3: The Relevance of the PBL Scenario to Nursing Practice

Question 3 asked the participants to comment the relevance of the PBL scenario to practice. Collaboration and partnerships are much-touted values in organizational life today. The participants expressed that the PBL scenarios and the project assisted them in development of collaborative relationships, namely, interdisciplinary and inter-institutional collaborations.

This is a comment from one student

“During our preparation for quality visit by the evaluating team, we worked with the multidisciplinary team members like the medical offices, the pharmacist in updating the emergency trolley and ward Treatment protocols. They really appreciated our efforts as nursing students to improve quality of nursing at the unit level One doctor actually wanted to see our scenario and learning plans and was impressed and act as a resource person on certain learning issues. The interdisciplinary relationship was strengthened.... We also worked together with nursing students from the neighbouring college.”

The other student commented as follows:

“The PBL scenarios helped greatly in bringing the university facilitators, clinical preceptors and unit managers. The unit managers co-operated so much in our project as well as preceptors. Every unit manager, doctor and preceptor wanted to see the student succeeding in the given project, by support, coaching and guiding.”

Table 4 displays the results from quantitative component in support of the findings of the qualitative component.

The majority of students (n=100; 74%) strongly agreed and (n=27; 20%) agreed, whilst only (n=8; 7%) disagreed that PBL scenarios assisted them in developing the interdisciplinary

Table 4: Effects of PBL scenario in nursing practice

Opinion	Strongly agree	Agree	Disagree	N
PBL scenarios assisted in developing the interdisciplinary collaboration	(n=100; 74%)	(n=27; 20%)	(n=8; 7%)	135
PBL scenarios assisted in developing the inter-institutional collaboration	(n=97;72%	(n= 29;22%	(n=8;7%)	135

collaboration, whilst (n=97; 72%); strongly agreed and (n=29; 21%) agreed and (n=9; 7%) disagreed that PBL scenarios assisted them in developing the inter-institutional collaboration during the preparation of quality improvement project.

This concurs with the report by Herrin et al. (2006) wherein it is documented that academic–practice collaborations are increasingly viewed as a requisite for the future of nursing and paramount to bridging education preparation and achievement of excellence in professional practice. Kirschling and Erickson (2010) also indicate that collaboration assists in bridging the gap between nursing practice and academia and that it is a necessary prerequisite for assuring a qualified nursing workforce for the future and for positioning nurses to address emerging healthcare needs.

Collaboration in implementing PBL in the nursing education, which encourages on-going interaction between educators and those who assist students in practice, may be the way forward to create a well-educated nursing workforce to be able to address the increasingly complex health needs of the region. Nurse educators need not to be far removed from practice and practitioners who are unaware of the relevance of theory to their work.

Theme 4: How PBL Scenarios Could be Improved for Effective Learning and Evaluation

Question 4 asked students to comment on how the scenario could be changed to improve learning. The participants were concerned about the period taken to conclude the scenario and the evaluation of the clinical project related to the scenario.

The quotes below depict the views of the students.

“We took more time to conclude the scenario as it brought up a lot of learning issues about nursing management, e.g. leadership, management, quality management, human resource, financial and material management. As compared to other subject this was the scenario that made us work hard only to be told that all the hypotheses are correct. I know it is said problems should be ill defined to address lot of learning areas. In evaluating, I wish it was like in OSCE where we are exposed to one team of evaluators.”

Another participant said

“Being evaluated by different teams sort of disadvantaged others groups. For example team A of evaluators have members of academic staff who are known for generosity whilst team B had very strict and stringiest markers. If only one team is evaluating all the groups, the better for all the groups. The uses of percentages or mark allocation were also demoralising. Maybe comment like competent or not competent was better.”

The views are supplemented by quantitative results wherein the participants who disagreed with the use of different panels to evaluate the clinical project. It should be noted that the (n=128; 95%) strongly agree with the use of intra-professional collaboration (Nurse Manager; Clinical Preceptors; and academic facilitator) in implementation and assessment PBL and requires use of only one team for evaluation for consistency and fairness. The results affirm the assertion by Levett-Jones et al. (2011) that the assessment of nursing students’ clinical competence has confronted universities with problems of validity, reliability, subjectivity and bias for many years.

Undoubtedly, for many students the clinical assessment process provokes anxiety and stress utilisation of one team for the eight groups is necessary for objectivity and consistency. Standards of consistency and fairness need to be ensured in all PBL assessment (Rideout 2001; Billings and Halstead 2009; Levett-Jones et al. 2011).

Incidental Findings

These are benefits of the study to the nursing department which were discovered during the project. Obtaining student feedback of students on use of PBL scenario in addressing quality improvement in nursing education and collaborative assessment of learning resulted in: 1) Provision of auditable evidence that students were given an opportunity to comment on modules and assessments (used for improvement); 2) Encouraging students to reflect on their learning; 3) Allowing institutions to benchmark and providing indicators contributing to the university reputation; and 4) Allowing students to express their level of satisfaction.

CONCLUSION

The main aim of nursing education is to improve quality of health care offered by professional staff, thus it is important that what nurses do, how and when they do it depends on quality of nursing education. We need to get it right.

As educators of healthcare professionals, it is our responsibility to design and deliver instruction to our students which best enhances their learning and acquisition of desired knowledge, skills, and attitudes for their future professional practice. PBL provides an environment for promoting these skills. Use of classroom centred PBL scenario was an effective strategy to address quality improvement in nursing education. Preparation for quality health care must begin in the basic education and should be integrated in the clinical education to be more meaningful.

RECOMMENDATIONS

In the current healthcare system, where quality of nursing service is emphasized, nursing education needs to respond to the demand for nursing quality PBL promotes critical thinking, self-directed study and problem solving by using scenarios related to certain health conditions.

The experience from this project showed that use of PBL scenario in addressing quality improvement in nursing education and collaborative assessment were perceived in a positive way by nursing students with the exception of use of different teams of assessment.

Students viewed the PBL scenarios as being realistic, relevant and aligned to clinical practice. PBL provided the students with an opportunity to use others as a resource solve problems, and learn to work collaboratively with the multidisciplinary team members. This enhances the skills of working in teams, promotes lateral thinking, and requires students to consider what it is they need to know in order to look after the client safely. The process allowed them to think critically about quality issues, thus closing the gap between theory and clinical practice.

LIMITATIONS OF THE STUDY

With the use of purposive sample of 4th year nursing students at NWU, the results are not generalizable. Not all aspects of Donald Kirk-

patrick's level of evaluation were used in this project.

ACKNOWLEDGEMENTS

The author acknowledges the participation of students as interviewees as well as Atlantic Philanthropies for generous funding for PBL development in North-West University.

REFERENCES

- Alessio H 2004. Student perceptions about and performance in problem-based learning. *Journal of Scholarship of Teaching and Learning*, 4(1): 23-34.
- Alexander JG, McDaniel GS, Baldwin MS 2005. If we teach them to fish: Solving real nursing problems through problem-based learning. *Annual Review of Nursing Education*, 3(9): 109-123.
- Barrows H 1998. The essentials of problem based learning. *Journal of Dental Education*, 4(2): 23-25.
- Billings DM, Halstead JA 2009. *Teaching in Nursing: A Guide for Faculty*. Saunders: Elsevier.
- Choi HJ 2004. The effect of PBL on the metacognition, critical thinking, and problem solving process of nursing students. *Journal of Korean Academy of Nursing*, 34(5): 712-721.
- Clark CM, Ahten SM, Macy R 2013. Using problem based scenario to prepare nursing students to address incivility. *Clinical Simulation in Nursing*, 9(3): 75-83.
- Cooper C, Carver N 2012. Problem based learning in mental health nursing: The students' experience. *International Journal of Mental Health Nursing*, 21(2): 175-183.
- Creswell JW, Plano Clark VL 2007. *Designing and Conducting Mixed Methods*. Cambridge: Cambridge University Press.
- Demiris G, Zierler B 2010. Integrating problem-based learning in a nursing informatics curriculum. *Nurse Education Today*, 30: 175-179
- Gwee MCE 2009. Problem-based learning: A strategic learning system design for the education of healthcare professionals in the 21st century. *Kaohsiung J Med Sci*, 25(5): 231-239.
- Herrin D, Hathaway D, Jacob S, Mckeeon L, Norris T, Spears P, Stegbauer C 2006. A model academic-practice partnership. *Journal of Nursing Administration*, 36(12): 547-561.
- Howard E 1990. Measurement of student clinical performance In: C Waltz, O Strickland (Eds.): *Measurement of Nursing Outcomes*. London: Routledge, pp. 31-43.
- Hwang, SY, Kim, MJ 2006. A comparison of problem-based learning and lecture-based learning in an adult health nursing course. *Nurse Education Today*, 26: 315-321.
- Hwang S, Jang KS 2005. Students' perceptions of problem-based learning in reflective journals among nursing students. *Journal of Korean Academy of Nursing*, 35(1): 66-77.
- Kirkpatrick DL, Kirkpatrick JD 2006. *Evaluating Training Programs: The Four Levels*. 3rd Edition. San Francisco, CA: Berrett-Koehler.

- Kirschlin JM, Erickson JI 2010. The STTI Practice–Academe innovative collaboration award: Honoring innovation, partnership and excellence. *Journal of Nursing Scholarship*, 42: 286–294.
- Koh G, Khoo H, Wong M, Koh D 2008. The effects of problem based learning during medical school on physician competency: A systematic review. *Canadian Medical Association Journal*, 178(1): 34–41.
- Kong L, Qin B, Zhou Y, Mou S, Gao H 2014. The effectiveness of problem-based learning on development of nursing students' critical thinking: A systematic review and meta-analysis. *International Journal of Nursing Studies*, 51: 458–469.
- Levett-Jones T, Gersbach J, Arthur C, Roche J 2011. Implementing a clinical competency assessment model that promotes critical reflection and ensures nursing graduates' readiness for professional practice. *Nurse Education in Practice*, 11: 1164–1169.
- Luo Y, Zhou D, Luo Y, Song Y, Liu D 2014. Investigation of nursing students' knowledge of and attitudes about problem-based learning *International Education Studies*, 1(1): 126–129.
- Munhall PL 2012. *Nursing Research: A Qualitative Perspective*. 5th Edition. Sudbury: Jones and Barlett Publishers.
- Parahoo K 2007. *Nursing Research: Principles: Process and Issues*. London: Macmillan Quantitative Approaches (Applied Social Research Methods, No. 46). Thousand Oaks, CA: Sage.
- Rideout E 2001. *Transforming Nursing Education through Problem Based Learning*. Toronto: Jones and Barlett Sage.
- Rideout E, England V, Brown B, Fothergill F, Ingram C, Benson G, Ross MA, Coates A 2002. A comparison of problem-based and conventional curricula in nursing education. *Advanced Health Science Education*, 7: 3–17.
- Schifferdecker KE, Reed VA 2009. Using mixed method research in medical education: Basic guidelines for researchers. *Medical Education*, 43: 637–644.
- South African Qualification Authority 2005. Understanding systematic change in building South African education and training system that is world class. *SAQA Bulletin*, 5(1): 6–12.
- Spiers JA, Williams B, Gibson B, Kabotoff W, McIlwraith D, Sculley A, Richard E 2014. Graduate nurses' learning trajectories and experiences of Problem Based Learning: A focused ethnography study. *International Journal of Nursing Studies*, 5: 1462–1471.
- Streubert-Speziale J, Carpenter DR 2007. *Qualitative Research in Nursing: Advancing the Humanistic Imperative*. Philadelphia: Lippincott.
- Tashakkori A, Teddlie C 1998. *Mixed Methodology: Combining Qualitative and Quantitative Approaches*. Thousand Oaks, CA: Sage.
- Tiwari A, Lai P, So M, Yeun K 2006. A comparison of the effects of problem-based learning and lecturing on the development of students' critical thinking. *Medical Education*, 40: 547–554.
- Tompkins C 2001. Nursing education for the twenty-first century In: E Rideout (Ed.): *Transforming Nursing Education through Problem Based Learning*. Toronto, ON: Jones and Bartlett, pp.1–19.
- Uys LR, Van Rhyn LL, Nomthandaso S, Gwele NS, McInerney P, Tanga T 2004 Problem-solving competency of nursing graduates. *Journal of Advanced Nursing*, 48(5): 500–509.
- Williams B, Spiers J, Fisk A, Richards L, Gibson B, Kabotoff W, McIlwraith D, Sculley A 2012. The influence of an undergraduate problem/context based learning program on evolving professional nursing graduate practice. *Nurse Education Today*, 3(2): 417–421.
- Wood S 2006. Views of the effectiveness of problem-based learning. *Nursing Times*, 102(21): 34–38.
- Yuan H, Williams BA, Fan L 2008. A systematic review of selected evidence on developing nursing students' critical thinking through problem-based learning. *Nurse Education Today*, 28: 657–663.
- Yuan H, Williams BA, Yin L, Liu M, Fang J, Pang D 2011. Nursing students' views on the effectiveness of problem-based learning *Nurse Education Today*, 31(6): 577–581.