EXPERIENTIAL LEARNING METHODS TO IMPROVE KNOWLEDGE AND COMPETENCY OF NURSING STUDENT: ADULT LEARNING IMPLICATION

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Abstract

The learning methods used at each age will be different. When in college, students must face the transition of roles as adult learners. The experiential learning method is one of the implications that can be offered in adult learning to facilitate knowledge construction and learning through interaction with an authentic environment. This literature review design aims to describe adult learning implication through three experiential learning methods, consist of problem-based learning, case-based learning, and simulation-based learning in nursing education. Data source was performed through *Scopus, ScienceDirect, Google Scholar* and *PubMed*. PCC approach was used (Population=*Nursing student; Concept= Adult learning; Content= Nursing education*) for searching keyword. Article selection based on year (2015-2021), full text, English, and original research. Of the 308 articles identified, 10 articles were eligible for analysis, consisting of 5 randomized controlled trials and 5 quasi-experimental studies. Problem-based learning (PBL) focuses on the process of problem solving and exploration of a case. Case-based learning (CBL) refers to the decision making and solution of a case. Simulation-based learning facilitates student skills according to the reality in clinical practice. Problem-based learning, case-based learning and simulation-based learning methods in nursing education are effective in increasing the knowledge, skills, and competency development of nursing students.

Keywords: *Adult learning, experiential learning, problem-based learning, case-based learning, and simulation-based learning*

INTRODUCTION

Students will need motivation and encouragement to face the transition of roles as adult learners when they are in college[1]. Students need to focus on directing themselves or learning independently to start thinking critically and understanding what is required and becomes their choice[2]. Therefore, appropriate learning methods can support achieving the expected learning outcomes.

In nursing education, adult learning methods for nursing students require them to solve problems or cases based on evidence and clinical practice by providing nursing care and those related to the provision of nursing services either individually by the nurses themselves or in collaboration with other related professions nursing[3]. Learning strategies that use an adult learning approach are quite diverse and adapt to the needs of learners and teachers[4].

Experiential Learning (EL) is a learning method that emphasizes challenges and experiences followed by reflection on the learning outcomes gained from these experiences. EL is not merely learning from experience but learning that uses experience as a learning medium[5]. EL is the implication of adult learning as a learning strategy to learn from experience and improve nursing students' critical thinking and competence[6].

MATERIAL AND METHODS

Protocol of Literature Review

Preparation of the literature review using the PRISMA flow diagram and evaluation protocol to determine the articles that have been found and determined according to the inclusion and exclusion criteria and then compiled based on the research objectives in this study. The selected articles were then subjected to a critical appraisal using a checklist for Quasi-experimental studies and the Randomized Control Trial from the Critical Appraisal Skill Program (CASP) 2019[7].

Searching Database

Search articles for the preparation of this literature review using four journal databases, namely Scopus, Sciencedirect, Google Scholar, and Pubmed.

Keyword

The PCC framework recommended by the Joanna Briggs Institute (JBI) becomes the reference for determining keywords. The search keywords are (Population=Nursing student; Concept= Adult learning; Content= Nursing education).

Inclusion and Exclusion criteria

This literature review's inclusion and exclusion criteria were used to screen articles and were defined according to the PCC framework. Inclusion criteria include RCT and quasi-experimental research methods, 2015-2021 publication years in English, and open access. As for the exclusion criteria for research before 2015 and the design of the survey, qualitative, and protocol studies.

Data Extraction

The data is extracted into a tabular form containing researchers, design, respondents, interventions, and research results.

RESULTS

Searching and Selection of Study Results

Based on the results of a literature search from four journal databases using keywords from the PCC framework, namely “Nursing student” AND “Adult learning” AND “Nursing education,” in the initial search, researchers found 29 articles on Scopus, 30 articles on Google scholar, 214 articles in Sciencedirect, and 35 articles in Pubmed based on the eligibility of inclusion and exclusion criteria (n=308). Then duplication (n=187) and title screening (n=20), followed by selecting the abstract and context (n=10). So that the rest of the articles obtained were ten articles adapted to the theme and problem formulation made. The flow of article selection is depicted in the PRISMA flow diagram (Figure 1).

Quality Assessment

Of the ten articles, five studies had results with a relatively good level of validity because they used a randomization technique, which is a technique to control confounding factors by distributing random confounders into study groups[8]. Meanwhile, five studies had lower validity, the allocation of research subjects into the intervention group and the control group was not carried out by randomization (see table 1).

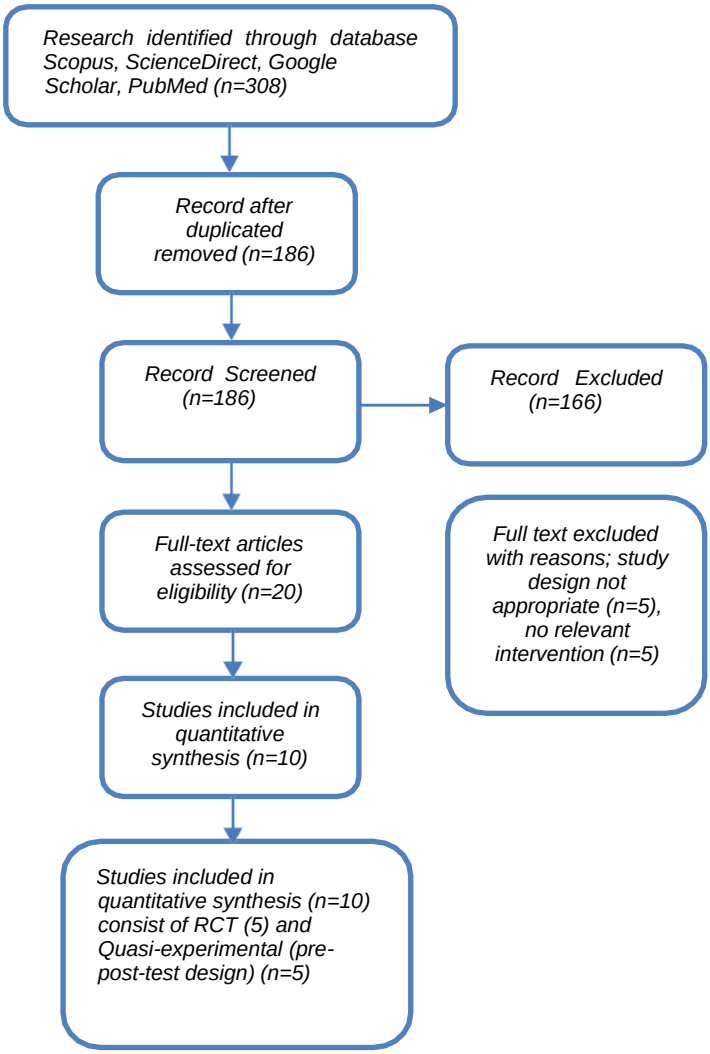

Figure 1. Prisma Flow Diagram

Analytical Finding

From the search results, the total number of participants was 980 participants, with 926 nursing students and 54 medical students. Research design in the literature was traced using RCT as many as five studies and quasi-experimental as many as five studies. This literature review study is divided into three kinds of methods for implementing adult learning-based learning, namely simulation of 7 articles, case-based learning of 1 article, and problem-based learning of 2 articles. The studies were conducted in Saudi Arabia, Japan, Tanzania, China, Brazil, South Korea, the United States, Spain, Iran. A summary of the search or data extraction is presented in table 2.

Tabel 1. Articles analysis by *Critical Appraisal Skill Programme* (2019)

Authors	Clear focused issue	Randomised allocation	Properly analysed	Blinding	Similar start	Treated equally	Treatment effect	Confidence limits	Applicability
Goolsarran et al., 2018	√	√	√	-	√	-	√	√	√
Gholami et al., 2021	√	-	√	-	√	√	√	√	√
Costa et al., 2020	√	√	√	-	√	-	√	√	√
Garcia-Acosta et al., 2019	√	-	√	-	√	√	√	√	√
Wang et al., 2015	√	√	√	-	√	-	√	√	√
Guerrero et al., 2021	√	√	√	-	√	-	√	√	√
Tamaki et al., 2019	√	√	√	-	√	-	√	√	√
Garcia et al., 2019	√	-	√	-	√	√	√	√	√
Yu et al., 2020	√	-	√	-	√	√	√	√	√
Millanzi & Kibusi, 2021	√	-	√	-	√	√	√	√	√

Researcher	Design	Participant	N	Sampling	Media	Intervention	Duration	Control Group	Instrument	Result
(Goolsarran et al, 2018)	RCT	26 Residents of first-year internal medicine, and 50 nursing students	76	Convenient sample	Power point presentation and manne quin	An interactive patient safety workshop that uses a reverse classroom approach that integrates team- based learning (TBL) and interprofessional simulation application exercises	2 months, with 3.5 hours of implementation for each workshop session	-	*Team Readiness Assurance Test* (TRAT), *Individual Readiness Assurance Test* (IRAT) dan *The Readiness for Interprofessional Learning Scale* (RIPLS)	Increased knowledge related to the Patient Safety concept in the Team Readiness Assurance Test (TRAT) compared to the Individual Readiness Assurance Test (IRAT). The post-workshop survey for RIPLS was higher than that for the pre-workshop, but statistically, only points of Positive Professional Identity were significant. In the self-assessment survey, 90% of participants agreed that the workshop had an impact on clinical practice.
(Gholami et al, 2021)	Quasi experimental	Nursing student's 3rd years	43	Convenient sample	Power point presentation	Case based Learning (CBL)	12 weeks	Lecture based learning (LBL)	*Problem-Solving Inventory* (PSI) and *the Instructional Materials Motivation Scale* (IMMS)	The average value of total problem-solving ability and all subscales did not change significantly from before to after LBL but increased from before to after CBL, and learning motivation was higher after CBL

Researcher	Design	Participant	N	Sampling	Media	Intervention	Duration	Control Group	Instrument	Result
										than LBL.
(Costa et al, 2020)	RCT	Nursing Students	34	No Clear	Simulation in the nursing laboratory	Classes with active student participation, skills training, and clinical simulation	40 hours	Classes with active student participation and skills training	Assignments and essay questions made by researchers	The group that received skills training and clinical simulation performed better in cognitive performance assessments, with statistical significance in both immediate and long-term knowledge assessments (1-20 days) than those receiving skills training alone.
(Tamaki et al, 2019)	RCT	Nursing Students	Intervention= 20 Control = 18			EOL (*end-of-life*) Care Simulation Program	March 2016 to March 2017	Palliative care class and with case study discussion	*Objective Structured Clinical Evaluations, and self-confidence related to end-of-life care by self-reported*	The simulation group improved significantly in knowledge, skill performance in physical assessment and psychological care, and confidence in relation to end-of-life care.

Researcher	Design	Participant	N	Sampling	Media	Intervention	Duration	Control Group	Instrument	Result
									questionnaires	
(Zaragoza-Garcia et al, 2021)	Quasi experimental	Clinical Nurse Student	Intervention = 56 control = 56		Simulation platform using vSim®	Learning using vSim® virtual simulation	May and July 2020	Carry out supervised health care activities in health care centers	Measurement of knowledge related to the basic concepts of pharmacology, pathophysiology, and nursing interventions	Knowledge and skill acquisition increase in those using virtual simulations. The level of confidence and satisfaction with the training and virtual simulation platform used is high.
(Millanzi & Kibusi, 2021)	Quasi experimental	Nursing Students	Intervention =134 control =267	*Cluster random sampling*	Modul	Problem Based Facilitatory Teaching Sessions	Early February 2018	Lecture-based learning (LBL)	*Academic Motivation Scale*	The probability of intervention to influence academic motivation among participants in Problem Based Facilitatory Teaching Sessions was higher than that of the control group. However, the intervention showed little effect on extrinsic learning motivation.

Researcher	Design	Participant	N	Sampling	Media	Intervention	Duration	Control Group	Instrument	Result
(García-Acosta et al., 2019)	Quasi experimental	Nursing Students	Intervention= 59, control = 57	No Clear	Modul	Training on transgender issues (TG S&W), Transgender Special Courses and Workshops with 31 film forums, and 28 PBL		No training	*Knowledge Questionnaire about Transgender (KQAT).*	The level of knowledge that took part in the training was higher than those who did not. Both methodologies increase the level of knowledge, but there is no significant difference between the two. The average satisfaction with the learning methodology used did not show a statistically significant difference.
(Wang et al, 2015)	RCT	Nursing Students	Intervention = 28, control = 27		Simulation	*Interprofessional Simulation-Based Education*		Traditional training	*Readiness for Interprofessional Learning Scale* (RILS) Open-ended questions using thematic analysis content and knowledge of the operating room.	The interprofessional simulation-based education group showed statistically different responses to four of the nineteen questions on the Readiness for Interprofessional Learning Scale, reflecting a more positive attitude toward

Researcher	Design	Participant	N	Sampling	Media	Intervention	Duration	Control Group	Instrument	Result
										interprofessional learning. Nursing students in the simulation-based education group experienced a significant increase in knowledge about operating room nursing.
(Guerrero et al., 2021)	RCT	Internship nursing student	Intervention= 15, control = 15			Simultaneous HFS (High Fidelity Simulation) exposure and hands-on clinical training	September 2019 to August 2020	Only receive hands-on clinical training	DOPS, mini-CEX, overall competency evaluation, case study presentation, post-rotation exam	The mean scores obtained by the group with simultaneous HFS were significantly higher than those obtained by the clinical training only group.
(Yu et al, 2020)	Pre and posttest survey	37 5th year medical students and 38 4th year nursing	75		Module, scenario, manne quin	Interprofessional education simulation	2 days		*Attitude Towards Teamwork in Training Undergoing Designed Education*	There was an increase in scores related to students' awareness of IPE learning and self-competence after conducting IPE simulations. The attitude scale with the Jefferson

Researcher	Design	Participant	N	Sampling	Media	Intervention	Duration	Control Group	Instrument	Result
		students							*Simulation scale, Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration*, dan competency scale *Interprofessional Education Collaborative*	Scale of Attitudes Toward Physician-Nurse Collaboration did not change significantly in medical students but increased significantly in nursing students.

DISCUSSION

Adult learning recommends that the learning experience be relevant to the learner. Thus, students should have the opportunity to engage in authentic clinical and team-based experiences[9]. Based on the theory obtained, adult learning plays an essential role in designing and implementing educational programs, including nursing education. One of the adult learning categories is Experiential learning[4]. From the results of the literature review that the author conducted, the strategies and learning methods of simulation-based learning, problem-based learning, and case-based learning in nursing education are the intervention options to increase nursing students' knowledge, skills, and competency development.

Simulation Methods

High Fidelity Simulation

Research by Guerrero et al.[10] conducted a randomized controlled trial to analyze the effect of High-Fidelity Simulation (HFS) on student performance. The results obtained that the application of HFS (High-Fidelity Simulation) is an alternative clinical training useful for improving nursing students' skills, competencies, and readiness in carrying out the clinical practice. These results are in line with research by Tamaki et al[11] that simulations effectively increase knowledge, skill performance, and self-confidence of nursing students.

Virtual based Simulation

The research of Zaragoza-García et al[12] using a web-based virtual simulation platform, showed a significant increase in the skills of nursing students, and the level of confidence and satisfaction with this simulation training was in the high category. VS is applicable in pandemic situations such as COVID-19. Based on the results obtained, researcher suggest using this platform to implement 100% remote VS may be a sufficient and feasible solution for developing basic skills, especially non-technical skills. However, it seems necessary to increase the number of cases applicable to each course skill and find a way to combine it with distance learning to develop technical skills[13].

Clinical Simulation

Clinical simulation is effective on the cognitive performance of nursing students in adult immunization scenarios. Clinical simulation promotes more effective learning (from a cognitive performance point of view) among nursing students in adult immunization scenarios in the context of primary health care (puskesmas)[14].

Interprofessional Simulation

Research by Wang et al.[15] reported that simulation integrated with education and interprofessional simulation positively impacted nursing students' perceptions of interprofessional learning and knowledge of operating room nursing. These results are supported by research from Goolsarran et al.[16] on team-based interprofessional simulations that can encourage interprofessional communication and learning; provide opportunities for different healthcare professionals to bring their discipline-specific perspectives into team discussions and as a team, all members agree on the best way to coordinate and deliver patient care. The results differ with Wang et al.[15] and Yu et al.[17] reporting through IPE simulations the perception of teamwork and collaboration between doctors and nurses showed no significant change among medical students but increased significantly among nursing students.

Metode Problem-Based Learning

The problem-based learning method is effective in increasing the level of knowledge[18]. According to Millanzi & Kibusi[19], problem-based learning pedagogy is predictive of intrinsic academic motivation among nursing students. This approach demonstrates the potential of education to change the spectrum of nursing competence and quality of care for the patient or client. According to them, the application of PBL is essential to be integrated into the nursing curriculum.

Metode Case based Learning

The CBL method effectively increases the perception of problem-solving abilities and learning motivation in undergraduate nursing students. With a clear and intuitive design and technology, nursing practice can be presented more clearly and more realistically, and students can be stimulated to solve patient problems[20]. Nursing educators can increase students' various ways of thinking, curiosity, self-development desire, and intrinsic motivation through interactive discussion, providing feedback and offering information related to daily life, and paying attention to metacognitive awareness and autonomy[21].

CBL is a form of Problem-based learning (PBL) and inquiry-based learning, considered a participatory teaching-learning method and categorized as contextual learning in nursing education[19,22]. This kind of learning strategy encourages the assimilation of the work environment, enhances nurses' transition to practice, and ultimately facilitates students' reflective learning, which helps them develop their problem-solving skills[19]. CBL can provide a source of cognitive learning and procedural learning and skill development, critical thinking, and problem-solving[23]. Problem-solving is an essential skill for nursing students to plan and provide safe care and holistic care to patients[22].

CONCLUSION

Experiential learning through problem-based learning, case-based learning, and simulation-based learning in nursing education effectively increases the knowledge, skills, and competency development of nursing students. In all research related to adult learning, nursing students have full involvement. Adult learning covers all aspects of the learning experience according to the level and ability of each individual.

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