Effect of Problem-Based Learning Training on Newly Graduated Nurses' Communication Skills, Self-Efficacy, and Clinical Competence

Nisreen Abdel Moneem Mohammad Shabana[1], Eman Shokry Abd Allah[2], Eman Ebrahim Abdel Fadil Mohamed[3], Fatma Abdelalim Ibrahim[4*]

(1) Lieutenant colonel /Master of Nursing and Hospital Administration. Military Institute of Health and Epidemiology Military – Medical Academy, Cairo. Egypt.

(2) Professor of Community Health Nursing & Gerontological Nursing-Head of Gerontological Nursing Department- Faculty of Nursing, Zagazig University

(3) Brigadier General / Assistant Professor of Nursing and Hospital Administration. Military Institute of Health and Epidemiology- Military Medical Academy, Cairo. Egypt.

(4) Assistant Professor of Community Health Nursing - Nursing College -Misr University for Science and Technology. **Corresponding Author [4*]: Fatma.ibraim@must.edu.eg**

Abstract

Background: Problem-based learning can help ease the transition from nursing education to clinical practice for newly graduated nurses. **Aim:** This study aimed to evaluate the effect of problem-based learning training on newly graduated nurses' communication skills, self-efficacy, and clinical competence. **Design:** A quasi-experimental design with pre- and post-tests was used for this research. **Setting:** The study was conducted at the Armed Forces Faculty of Medicine Hospital. Subject: A convenience sample of 60 nurses, represented for all newly graduated nurses from the Armed Forces Technical Health Institute, 2022/2023 academic year batch. **Tools for Data Collection:** Five tools were used to collect data of the study. tool I was a questionnaire to assess the demographic characteristic such as age, sex, marital status, tool II was scale to assess student performance during tutorial sessions in problem-based learning (PBL), tool III was to the adapted instrument Kalamazoo essential elements to assess the communication checklist, tools IV was scales to assess the general self-efficacy and tool V was scale to assess the clinical competence. **Results:** The study findings revealed that the mean age of the study participants was 23± 1.0. Statistically significant mean differences were found between the pre-post problem-based training: performance; communication skills; general self-efficacy; and clinical competency. **Conclusion:** The newly graduated nurses' communication skills, self-efficacy and clinical competence levels were improved after the problem-based learning training. **Recommendation:** Adoption of the PBL approach in the nursing curriculum at the Military Technical Health Institute.

Keywords: Problem-Based learning; newly graduated nurses; Communication skills; Self-efficacy; Clinical competency; Military nurse

Introduction

Nurses provide vital care regarding emergency preparedness and response capacity, in addition to the global effort making to achieve the Sustainable Development Goals (SDGs), **(WHO, 2020).** military nurses all over the world have been deployed alongside their armies to provide health care during conflicts or to provide humanitarian aid in response to disasters and public emergencies. They provide general preventive and acute care for militaries and civilians members and their families extend to the community. A new graduate nurse's competency is essential to patient safety and quality care, meet population needs and protect the public. Developing competence is an essential component of nursing education to ensure their preparedness with the essential knowledge, skills, and attitudes to enter the workforce and function safely at entry-level **(Hyun et al., 2022).**

Leonard et al., (2022) found that the new graduate nurses (NGN) often have an idealistic view of nursing compared to the reality of providing complex patient care. NGNs may lack communication and collaborations skills needed to effectively interact with challenging patients, families, and interdisciplinary teams, leading to stress and burnout. A scoping review by **Baharum et al., (2023)** emphasized that nursing education at the institution level, empowered, and strengthened and boosted by a positive personality to effectively aid new nurses in

achieving self-adjustment of nurse's transition from new graduate to profession.

Problem-based learning in nursing education offers a dynamic and interactive approach to learning that prepares nursing students for the complexities of contemporary healthcare practice. It offers newly graduated nurses a valuable platform for ongoing skill development, knowledge application, confidence building, and professional growth as they embark on their nursing careers (**Jamshidi et al., 2021 and Lang & Parkinson, 2023**).

The PBL encourages active participation in group discussions, case presentations, and collaborative problem-solving activities. Through these interactions, students have the opportunity to practice verbal and written communication skills. Working on realistic patient cases in PBL scenarios requires students to articulate their thoughts, ask questions, and convey information effectively to their peers and instructors. By engaging in PBL, newly graduated nurses can develop confidence in communicating with patients, families, and other healthcare professionals, leading to improved communication skills in clinical practice (**Syarafina et al,.2018, Servant-Miklos et al, 2019 & Mahnaz Moallem et al., 2019**).

Concerning Self-Efficacy, PBL fosters a student-centered learning environment where learners take responsibility for their own learning process. As students actively engage in identifying learning needs, seeking information, and solving problems, they develop a sense of self-efficacy (**Demirören et al., 2016**). The social cognitive theory postulates self-efficacy beliefs are shaped by four sources of information: mastery experiences, social modeling, social persuasion, and physiological and affective states (**LaMorte, 2022**). Physiological and affective states refer to the individual's physiological and emotional reactions to performing specific tasks (**Cansiz, 2019**). Successfully navigating through PBL scenarios and contributing to group discussions can enhance students' belief in their ability to tackle challenges and achieve goals. The collaborative nature of PBL provides opportunities for peer support and feedback, which can boost students' confidence in their

clinical skills and decision-making abilities (**Ghani, et al., 2021**)

Regarding clinical competency, PBL promotes the integration of theoretical knowledge with clinical practice by presenting students with authentic patient cases and scenarios. Through PBL, newly graduated nurses learn to apply theoretical concepts to practical situations, develop clinical reasoning skills, and make evidence-based decisions. Engaging in problem-solving activities within a supportive learning environment allows students to practice clinical skills, such as patient assessment, prioritization, and intervention, which are essential for clinical competency. PBL emphasizes the importance of critical thinking and reflection, which are key components of clinical competence in nursing practice (**Damodaran et al., 2023**).

Newly graduated nurses (NGNs) face a labor market with problems related to work or care provided to the patient. NGNs often struggle with low levels of self-efficacy, which can affect their communication skills and clinical competencies. Nurses need to be educated and trained to have communication skills, self-efficacy, and competence in nursing practice to be able to decrease the cost of health care and to increase the quality of care in the future (**Fukada, 2018**).

Significance of the study:

PBL can help ease the transition from nursing education to clinical practice for newly graduated nurses. By engaging in problem-solving activities that simulate real-world clinical scenarios, students develop the critical thinking and decision-making skills necessary for effective practice. Existing studies suggest that PBL can play a valuable role in nursing education by enhancing clinical competency, facilitating professional development, and preparing new graduates for successful transitions to clinical practice. (**Sharma et al., 2023**).

The relationship between problem-based learning (PBL) and communication skills, self-efficacy, and clinical competency among newly graduated nurses is multifaceted and interconnected (**Salari et al., 2021**).

NGNs must have communication skills, self-efficacy, and competence in nursing practice, which plays a very important role in promoting interaction, teamwork, motivation of learning, interpersonal skills (**Ancel, 2016).**

PBL has been shown to be effective in enhancing communication skills, self-efficacy, and competence in nursing practice. Meanwhile, research on the impact of PBL specifically on newly graduated nurses is somewhat limited but there are studies that provide insights into its effectiveness in nursing education and its potential benefits for new graduates. More research specifically development and effects of PBL on newly graduated nurses is needed, therefore, the aim of the present study was to evaluate the effect of problem-based learning training on newly graduated nurses' communication skills, self-efficacy, and clinical competence.

Problem-Based Learning Model

Problem-Based Learning (PBL) is an educational methodology that emphasizes active learning, critical thinking, and problem-solving skills. In PBL, students take on a more active role in their learning process. The PBL model typically works as (Figure 1): **Identifying a Problem:** PBL begins with the presentation of a complex, real-world problem or scenario that students are likely to encounter in their field of study or profession. **Student-Led Exploration:** Students are tasked with exploring the problem, usually working in small groups. They analyze the problem, identify what they already know, what they need to know, and how they can find that information. **Research and Inquiry:** Students conduct research, using a variety of resources such as textbooks, academic journals, the internet, and interviews with experts. They engage in self-directed learning to deepen their understanding of the problem and related concepts.
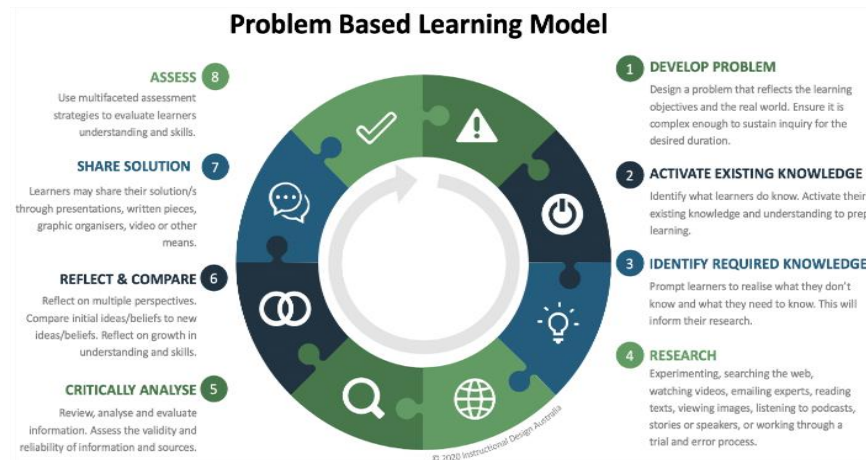
Figure 1: Problem Based Learning Model adopted from Instructional Design Australia. (2020)

Collaborative Learning: PBL encourages collaboration among students. Group members share their findings, discuss different perspectives, and work together to develop possible solutions to the problem. **Application of Knowledge:** Once students have thoroughly explored the problem and possible solutions, they apply their knowledge and skills to develop a solution or a series of solutions. This might involve designing experiments, creating models, or proposing strategies. **Presentation and Reflection:** Finally, students present their findings and proposed solutions to their peers and often to the instructor or a panel of experts. This presentation stage encourages students to articulate their thought process, defend their ideas, and receive feedback. After the presentation, students reflect on what they've learned and how they can apply it in the future. PBL can be adapted to various educational levels and disciplines, from primary school to

higher education and professional training. It aligns well with constructivist theories of learning, which emphasize the importance of learners constructing their own understanding through active engagement with the material.

Aim of the study:

The aim of the present study was to evaluate the effect of problem-based learning training on newly graduated nurses' communication skills, self-efficacy, and clinical competence.

This aim was fulfilled through the following objectives:

1- To assess communication skills, self-efficacy level and clinical competence level of newly graduated nurses before problem-based learning training.
2- To design, plan and implement problem-based learning training for newly graduated nurses.
3- To evaluate communication skills, self-efficacy level and clinical competence level of newly graduated nurses after problem-based learning training.

Research hypothesis:

H1: The newly graduated nurses' communication skills level will be improved after the problem-based learning training.

H2: The newly graduated nurses' self-efficacy level will be improved after the problem-based learning training.

H3: The newly graduated nurses' communication skills clinical competence level will be improved after the problem-based learning training.

Subjects and methods

Research Design

Quasi-experimental one-group pretest-posttest was utilized to achieve the aim of the study.

Study Setting

This study was conducted in the Armed Forces Faculty of Medicine Hospital (AFFOMH). The AFFOMH medical care is provided to civilians only. The AFFOMH has outpatient and inpatient medical services that cover various specialties, e.g.: general surgery, internal medicine, obstetrics, and gynecology, NICU, ICU, renal dialysis, physiotherapy, and emergency. The outpatient clinics are covering for these specialties. Also, the hospital has a teaching building that is occupied with lectures rooms, teaching and learning methods, skill lab, library, networks.

Study Subjects

A convenient sample of all newly graduated nurses (NGNs) (n=60) from the Mi Technical Health Institute. They studied for two years followed by internship for six months, 2022/2023 batch, both sex, who agreed to participate in the study, and completed the data collection tools.

Tools of Data Collection:

Five tools were operated to collect data of the present study:

Tool I: A questionnaire sheet of demographic data of the to assess the demographic data as age, sex, marital status, residency, also whether yes/no previous training received on of PBL training, communication skills, self-efficacy, and clinical competency.

Tool II: A 24-item rating scale to assess student performance during tutorial sessions in problem-based learning (PBL). The scale was developed by **Valle et al., 1999** and adopted in the present study to assess student performance during tutorial sessions in problem-based learning (PBL). The scale consisted of four factors. The first factor, independent study, comprises nine items linked to students' initiative, motivation, and persistence in searching for information, studying and achieving the learning objectives and tasks agreed on by the group. The second Group interaction factor included five items referring to concern students' abilities to function in a group, such as openness to suggestions and decisions, adjustment to different group roles and respect towards their peers. The third Reasoning skills included six items related to students' ability to analyze cases, formulate hypotheses, and clarify concepts. The fourth factor was called active participation and included four items reflect a specific form of interacting with the group that includes behaviors such as contributing, helping, and sharing reflections, ideas, and knowledge. The questionnaire used for tracking the evolution of attitudes and skills

during tutorials, serving as a tool for providing useful feedback for students and evaluating overall tutorial group performance at the end of the course. The scale fundamental components of the PBL method are observable in tutorial groups and could be a useful assessment instrument for tutors wishing to monitor students' progress in each of these components. The scale was adopted in the present study to assess new nurses' performance during pre-post problem-based learning (PBL) training.

Scoring: They describe behaviors that the tutor has to rate on a six-point scale ranging from never (1) to always (6) to indicate current frequency. The total scores range from 24 to 144 with higher scores indicating greater performance in PBL sessions.

Interpret Scores: Interpret students' scores by considering their overall performance relative to the established criteria. Higher scores indicate greater proficiency in PBL skills, while lower scores may suggest areas for improvement or further development.

Tool III. The Adapted instrument Kalamazoo Essential Elements Communication Checklist (KCS) was developed and minimally modified by **Rider et al., 2006 & Rider et al., 2007, Joyce et al., 2010.** A modified version used a Likert scale for both the 7 competencies and 24 sub-competencies. The competencies and sub-competencies as follow; the communication skills included build a relationship (3 items), open the discussion (3 items), gather information (4 items), understand the patient's perspective (3 items), share information (4 items), reach agreement (if new/changed plan) (3 items) and provide closure (4 items). The scale was adopted in the present study to assess new nurses' communication skills pre-post problem-based learning (PBL). training.

Scoring: Using global ratings on a Likert scale (1 = poor to 5 = excellent) for the 7 KCS competencies, responses to the 7 items are summed to provide a total communication score, The total scores range from 24 to 120 based on a Likert scale (1 = poor to 5 = excellent)

Tool IV: The general self-efficacy scale: the general self-efficacy scale developed by **Schwarzer and Jerusalem (1995).** This scale consists of 10 statements aimed to assess the strength of an individual's belief in his or her ability to respond to novel or stressful situations and deal with any associated obstacles. The general self-efficacy scale was adopted in the study to assess new nurses' self-efficacy pre-post problem-based learning (PBL). training.

Scoring: A four-point Likert scale was used, ranging from 1 ("not at all true") to 4 ("exactly true"). The scores for each of the 10 items are summed to give a total score. Based on the total scores that range from 10 to 40 the higher the score, the greater the individual's generalized sense of self-efficacy.

Tool V: The clinical competence questionnaire (CCQ).

CCQ is a scale developed **by Liou and Cheng (2013)** to measure the perceived clinical competence of upcoming graduate baccalaureate nursing students. The CCQ consists of four competency components with corresponding and specific competencies required for undergraduate nursing students, as follows: (a) nursing professional behaviors (16 competencies), (b) general performance (12 competencies), (c) core nursing skills (12 competencies), and (d) advanced nursing skills (six competencies). The CCQ scale is necessary because it provides educators in nursing a preliminary way to understand the confidence of new nurses and nursing students in terms of their clinical performance. The CCQ scale was adopted in the study to assess new clinical competency pre-post problem-based learning (PBL) training.

Scoring: The instrument uses a five-point Likert scale, with item response scores ranging from 1 ("do not have a clue") to 5 ("known in theory, competent in practice without any supervision"). To obtain an overall score on the CCQ, sum the ratings for all items. The total scores range from 46 to 230, This total score reflects the individual's perceived level of clinical competence across the various domains assessed by the questionnaire. Accordingly, a higher score indicating an individual's self-perception of a higher level of clinical competence.

Validity and Reliability of the Tools:

The Face and content validity was ascertained by 5 experts from faculty of nursing in the specialties of community health nursing and nursing administration who reviewed the tools content for clarity, relevance, comprehensiveness, and understanding.

The reliability of the tools (II, III, IV and V) was tested using the internal consistency method. It proved to be high with Cronbach's alpha reliability coefficients was (.79, .84, 87.5, and.98.).

Ethical considerations:

An ethical approval was obtained from the scientific research ethical committee at Military Medical Academy, the institution review board of the military medical academy (IRB-MMA) approval number is 0438. Participation in the study was voluntary after complete full information was given about the study and their role before signing the informed consent. The participants can refuse and withdraw at any time from the study without any effect in their work. Confidentiality, anonymity, and privacy were assured to the nurses through using code numbers, ethics, values, culture, and beliefs respected.

Pilot study

A pilot study was carried out to test the feasibility, respected. applicability, and the time required for completion of the data collection tools on 10% of the newly nurses (6 participants). No modification was made to the data collection tools and the participants who participated in the pilot were included in the study.

Fieldwork

- The ethical approval obtained on date of 5/8/2023. Official permission was issued from the Head of Military Institute of Health & Epidemiology to the Armed Forces faculty of medicine hospital. The purpose of the study and its procedures were explained to them to get their consent and cooperation.
- The tools and the scenarios were submitted to 5 experts from nursing in different specialties were reviewed the tools content for clarity, relevance, comprehensiveness, and understanding. Also, to determine their applicability and content validity. Tools of data collection were tested for their reliability then the pilot study was conducted.

- A pilot study was done on 6 NGNs to test clarity and applicability of the tool, and time needed to conduct the study.
- Data collection carried out two months passed from the newly graduated nurses' initial employment at the Armed Forces Faculty of Medicine Hospital.

Through the period from August 2023 until November 2023

Problem-Based Learning training process:

Developing handouts of PBL scenarios: Four PBL scenarios were developed using the textbooks and electronic resources that included real and clinical situations with objectives that implied practicing communication skills, self-efficacy and clinical competencies. Preparation of training environments and all needed resources were prepared to facilitate PBL training. The study participants were divided into 6 groups/ 10 participants for each group. Each scenario took four sessions; each session lasted on average of 3 hours.

The PBL training was conducted according to the steps of the first principles of instruction **Merrill (2012).**

- 1st step: Reading the problem scenario and encouraging students to clarify vague concepts. 2nd step Defining the problem by the instructor. 3rd step Brainstorming and group discussion about the problem 4th step: Listing facts and generating hypotheses based on the scenario content, and answering the questions based on the nursing process to achieve educational goals. 5th step: Reaching a consensus on learning objectives within the group and the instructor assurance of achieving complete, comprehensive, and appropriate goals. 6th step: Conducting independent and group study to gather information using the library and the internet from resources introduced. 7th step: Presenting and analyzing the solutions based on the hypotheses, goals, and questions, conducting interdisciplinary discussion, summarizing, and evaluating the presented solutions by the instructor.

Evaluation phase: pretest was done before training while the posttest was done after the fourth Scenario. The evaluation of PBL training performance; communication skills; self-efficacy and clinical competencies. Tool II was performed by the researcher to assess pre-

post PBL training performance. On the other hand, tools III, IV and V to evaluate the pre-post PBL training of communication skills; self-efficacy; and clinical competencies were demonstrated by the study participants.

Statistical analysis

Upon completion of data collection, data was revised, coded, computed and analyzed using Statistical Package for the Social Science (SPSS), version 27 for analysis. The P value was set at 0.05. Descriptive statistics tests as numbers, percentage, mean ± standard deviation (Mean ± SD), was used to describe the results. The inferential statistics including paired t-test that was used to determine whether the mean difference between pre-post PBL training performance; communication skills; self - efficacy; and clinical competencies among the study participants. The Pearson correlation coefficient (r) was used to measure the strength of the relationship between demographic data and study variables and their association with each other. The given graphs were constructed using Microsoft Excel software.

Results:

Table (1): Shows distribution of the NGNs according to their demographic characteristics (n=60). The demographic characteristics were revealed that the age group ranged between 21 and 24 years with a mean score of 23±1.00. As regard sex of the study sample included 40% and 60% of them were male and female respectively, 66,7% of them were single and 55 % were urban residence. All the studied sample have no previous experiences training received on problem-based learning, communication skills, general self-efficacy, and clinical competencies.

Table (2): Elicits the distribution of the pre-post of the PBL training performance factors of the study participants (n=60). The PBL training performance consists of factors; independent study, group interaction, reasoning skills and active participation are factors of the PBL training performance. The mean scores were 3.51 ± 0.65 (Sometimes done), 4.38± 0.64(Sometimes done), 3.53 ± 0.65(Occasionally done), and 3.37 ± 0.66 (Occasionally done) in the pre PBL training performance factors respectively, with the total mean scores 3.95± 0.53 (Sometimes done). While the mean scores were 5.93 ± 0.51 (Often done),

6.00 ± 0.00 (Always done), 5.97 ± 0.18 (Often done), and 5.83 ± 0.38 (Often done) in the post PBL training performance factors respectively, with the total mean scores 6.00± 0.00 (Always done). Besides, a statistically significant differences between pre-post mean scores in PBL training performance in all factors were found (p < .05).

Table (3): Explains the distribution of the pre-post of the PBL training communication skills of the study participants (n=60). The communication skills include seven items; building a relationship, open the discussion, gather information, understand the PBL perspective, share information, reach agreement (if new/changed plan) and provide closure items. The mean scores were 3.00± 0.00 (Good), 2.57 ± 0.50 (Good), 2.23 ± 0.43 (Fair), 1.98± 0.13 (Fair), 2.00 ± 0.00 (Fair), 1.90 ± 0.30 (Fair) and 1.90 ± 0.30 (Fair) in the pre PBL training performance communication skills items respectively, with the total mean scores 2.42± 0.50 (Fair). Even as the mean scores were 4.77 ± 0.43 (Excellent), 4.77 ± 0.43 (Excellent), 4.77 ± 0.43 (Excellent), 4.75 ± 0.44 (Excellent), 4.77 ± 0.43 (Excellent) and 4.82± 0.39 (Excellent) in the post PBL training performance factors respectively, with the total mean scores 4.82± 0.39 (Excellent). Likewise, a statistically significant differences between pre-post mean scores in PBL training communication skills in all items were found (p < .05).

Table (4): Shows distribution of the pre-post PBL training general self-efficacy of the study participants (n=60). The general self-efficacy consisted of ten items. On viewing the pre-self-efficacy pre PBL training, the mean scores ranged between 2.50± 0.59 and 2.63± 0.58 with total mean score 3.02± 0.29 (Moderately true). On the other hand, in the post PBL training self-efficacy, the mean score ranged between 3.22 ± 0.42 and 3.77 ± 0.43 with total mean score of 3.95 ± 0.22 (Exactly true). Also, a statistically significant difference was revealed between the pre-post PBL training general self-efficacy (p < .05).

Table (5): Illustrates the distribution of the pre-post of the PBL training performance factors of the study participants (n=60). The PBL training performance consists of four competencies: nursing professional behaviors, general performance, core nursing skills and advanced nursing skills. The mean scores were 3.22± 0.42

(Moderate), 3.13± 0.34 (Moderate), 3.27± 0.45 (Moderate), and 3.27± 0.45 (Moderate) in the pre PBL training performance factors respectively, with the total mean scores 3.27± 0.45 (Moderate). While the mean scores were 4.00 ± 0.00 (Competent) in all post PBL training clinical competencies, with the total mean scores 4.00 ± 0.00 (Competent). A statistically significant differences between pre-post mean scores in PBL training performance in all factors were revealed (p < .05).

Table (6): Shows the correlation between pre-post PBL training performance, demographic data, communication skills, self-efficacy, and clinical competency of the study participants (n=60). A significant correlation at the 0.01 level (2-tailed) were found between marital status and residency, total post PBL training performance and total post PBL training communication skills, total pre PBL training self-efficacy and total post PBL training self-efficacy. While a significant correlation at the 0.05 level (2-tailed) were found between total post PBL training performance and total post PBL training self-efficacy, total post PBL training communication skills and total post PBL training self-efficacy.

Table (1): Distribution of the Studied Nurses According to Their Demographic Characteristics (n=60)

Demographics Characteristics		No.	%
– Age/year	21-22	26	43.3
	23-24	34	56.7
	Total	60	100
	Mean ± SD	23 ±1.00	
– Sex	Male	24	40.0
	Female	36	60.0
	Total	60	100
– Marital Status	Single	40	66.7
	Married	20	33.3
	Total	60	100
– Residency	Urban	33	55.0
	Rural	27	45.0
	Total	60	100
Previous Training on:			
– Problem-Based Learning	No	60	100
– Communication Skills	No	60	100
– General Self-Efficacy	No	60	100
– Clinical Competencies	No	60	100

Table (2): Means Scores Differences of the Pre-Post PBL Training Performance Factors among the Study Participants (n=60)

Factors of PBL Training Performance	Pre PBL-Training Performance Total Mean ± SD	Post PBL Training Performance Total Mean ± SD
Independent Study	3.51 ± 0.65 (Sometimes done)	5.93 ± 0.51 (Often done)
	Paired t test 31.481 P value .000 p < .05 (s)*	
Group Interaction	4.38± 0.64 (Sometimes done)	6.00 ± 0.00 (Always done)
	Paired t test 27.335 P value .000 (S)*	
Reasoning skills	3.53 ± 0.65 (Occasionally done)	5.97 ± 0.18 (Often done)
	Paired t test 28.681 P value .000 (S)*	
Active Participation	3.37 ± 0.66 (Occasionally done)	5.83 ± 0.38 (Often done)
	Paired t test 27.459 P value .000 (S)*	
Total Pre-Post PBL Training Performance	3.95± 0.53 (Sometimes done)	6.00± 0.00 (Always done)
	Paired t test 33.69 P value .000 (S)*	

(s)* significant

Table (3): Means Scores Differences of the Pre-Post PBL Training Communication Skills among the Study Participants (n=60)

Communication Skills Items	Pre PBL-Training Mean ± SD	Post PBL Training Mean ± SD
Build a Relationship	3.00± 0.00 (Good)	4.77 ± 0.43 (Excellent)
	Paired t test 35.234	P value .000 (S)*
Open the Discussion	2.57 ± 0.50 (Good)	4.77 ± 0.43 (Excellent)
	Paired t test 34.241	P value .000 (S)*
Gather Information	2.23 ± 0.43 (Fair)	4.77± 0.43 (Excellent)
	Paired t test 48.709	P value .000 (S)*
Understand the PBL Perspective	1.98± 0.13 (Fair)	4.75 ± 0.44 (Excellent)
	Paired t test 47.841	P value .000 (S)*
Share Information	2.00 ± 0.00 (Fair)	4.77 ± 0.43 (Excellent)
	Paired t test 41.882	P value .000 (S)*
Reach Agreement (if new/changed plan)	1.90± 0.30 (Fair)	4.77 ± 0.43 (Excellent)
	Paired t test 39.637	P value .000 (S)*
Provide Closure	1.90 ± 0.30 (Fair)	4.82± 0.39 (Excellent)
	Paired t test 39.202	P value .000 (S)*
Total Pre-Post PBL Training Communication Skills	2.42± 0.50 (Fair)	4.82± 0.39 (Excellent)
	Paired t test 46.858	P value .000 (S)*

(s)* significant

Table (4): Means Scores Differences of the Pre-Post PBL Training General Self-Efficacy among the Study Participants (n=60)

General Self-Efficacy	Pre PBL-Training Mean ± SD	Post PBL Training Mean ± SD
1. I can always manage to solve difficult problems if I try hard enough	2.50± 0.59	3.77 ± 0.43
2. If someone opposes me, I can find the means and ways to get what I want	2.63± 0.58	3.77 ± 0.43
3. It is easy for me to stick to my aims and accomplish my goals.	2.60± 0.59	3.72 ± 0.45
4. I am confident that I could deal efficiently with unexpected events.	2.47± 0.60	3.63 ± 0.48
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.	2.48± 0.60	3.63 ± 0.49
6. I can solve most problems if I invest the necessary effort.	2.63± 0.58	3.60 ± 0.49
7. I can remain calm when facing difficulties because I can rely on my coping abilities.	2.60± 0.59	3.77 ± 0.43
8. When I am confronted with a problem, I can usually find several solutions.	2.48± 0.60	3.22 ± 0.42
9. If I am in a bind, I can usually think of something to do.	2.55± 0.59	3.65 ± 0.48
10. No matter what comes my way, I'm usually able to handle it.	2.63± 0.58	3.57 ± 0.50
Total Pre-Post General Self-Efficacy	3.02± 0.29 (Moderately true)	3.95 ± 0.22 (Exactly true)
Paired t test-P value	**t 23.314 - P value .000 (S)***	

(s)* significant

Table (5): Means Scores Differences of the Pre-Post PBL Training Clinical Competencies among the Study Participants (n=60)

Clinical Competencies	Pre PBL-Training Clinical Competencies Mean ± SD	Post PBL Training Clinical Competencies Mean ± SD
Nursing Professional Behaviors	3.22± 0.42 (Moderate)	4.00 ± 0.00 (Competent)
	Paired t test 14.605	P value <.001 (S)*
General performance	3.13± 0.34 (Moderate)	4.00 ±0.00 (Competent)
	Paired t test 18.79	P value <.001 (S)*
Core Nursing Skills	3.27± 0.45 (Moderate)	4.00 ± 0.00 (Competent)
	Paired t test 22.002	P value <.001 (S)*
Advanced Nursing Skills	3.27± 0.45 (Moderate)	4.00 ± 0.00 (Competent)
	Paired t test 12.738	P value <.001 (S)*
Total Pre-Post PBL Training Clinical Competency	3.27± 0.45 (Moderate)	4.00 ± 0.00 (Competent)
	Paired t test 8.691	P value <.001 (S)*

(s)* significant

Table (6): Correlation between Pre-Post PBL Training Performance, Demographic Data, Communication Skills, Self-efficacy, and Clinical Competency of the Study Participants (n=60)

Variable	Pearson Correlation	Sex	Marital Status	Residency	Total pre PBL training performance	Total post PBL training performance	Total pre PBL training communication skills	Total post PBL training communication skills	Total pre PBL training self-efficacy	Total post PBL training self-efficacy	Total pre PBL training clinical competency	Total post PBL training clinical competency
Sex	R value	1	.000	-.219	-.141	.a	.207	-.123	.047	.125	-.123	.a
	Sig.		1.000	.093	.282	.	.112	.349	.720	.342	.349	.
Marital Status	R value	.000	1	-.426**	.067	.a	-.024	.244	-.164	.000	.053	.a
	Sig.	1.000		.001	.613	.	.856	.061	.212	1.000	.686	.
Residency	R value	-.219	-.426**	1	-.168	.a	-.153	-.091	-.052	-.100	.061	.a
	Sig.	.093	.001		.201	.	.244	.490	.691	.448	.646	.
Total pre PBL training performance	R value	-.141	.067	-.168	1.000	.107	.098	.124	.167	.044	-.087	.a
	Sig.	.282	.613	.201	.	.415	.458	.344	.202	.738	.508	.
Total post PBL training performance	R value	.a	.a	.a	.107	1.000	.157	.392**	-.313*	-.043	.112	.a
	Sig.	.	.	.	.415		.231	.002	.015	.747	.394	.
Total pre PBL training communication skills	R value	.207	-.024	-.153	.098	.157	1.000	-.124	.067	.194	-.051	.a
	Sig.	.112	.856	.244	.458	.231	.	.346	.610	.138	.699	.
Total post PBL training communication skills	R value	-.123	.244	-.091	.124	.392**	-.124	1.000	.026	.287*	-.006	.a
	Sig.	.349	.061	.490	.344	.002	.346	.	.844	.026	.961	.
Total pre PBL training self-efficacy	R value	.047	-.164	-.052	.167	-.313*	.067	.026	1.000	.539**	-.166	.a
	Sig.	.720	.212	.691	.202	.015	.610	.844	.	.000	.206	.
Total post PBL training self-efficacy	R value	.125	.000	-.100	.044	-.043	.194	.287*	.539**	1.000	-.035	.a
	Sig.	.342	1.000	.448	.738	.747	.138	.026	.000	.	.793	.
Total pre PBL training clinical competency	R value	-.123	.053	.061	-.087	.112	-.051	-.006	-.166	-.035		.a
	Sig.	.349	.686	.646	.508	.394	.699	.961	.206	.793		.
Total post PBL training clinical competency	R value	.a	.a	.a	.a	.a	.a	.a	.a	.a	.a	.a
	Sig.	.	.	.	.	.	.	.	.	.	.	.

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

Discussion

Indeed, military nurses play a crucial role in providing healthcare services across various settings, including communities, hospitals, and disaster sites. Their responsibilities encompass a wide range of duties, However, fulfilling these responsibilities often presents unique challenges that require better preparation and sufficient support enables them to gain growth. PBL provides military nurses with opportunities to apply theoretical knowledge to practical patient care situations, promoting the integration of theory and practice and can help ease the transition from nursing education to clinical practice for newly graduated nurses **Ma et al., (2021).**

The PBL training is tangible in practicing communication skills and self-efficacy are integral parts in clinical competency. The current study was conducted to evaluate the effect of PBL training on communication skills, self-efficacy, and clinical competency among newly graduated nurses (NGNs) from military technical health institute. Back to the current study, the findings have supported research hypothesis, the research hypothesis, the newly graduated nurses' (NGNs) communication skills, self-efficacy and clinical competence levels were improved after the problem-based learning training.

The students' experiences of applying problem-based learning to train the core competence teamwork and collaboration and abilities practiced in the base group were described including taking personal responsibility, practicing role distribution and leadership, developing communication skills, and creating togetherness in the base group **(Allert et al., 2021).**

Effective communication skills, self-efficacy, and clinical competency are critical attributes for newly graduated nurses as they navigate their roles in healthcare settings to ensure the delivery of high-quality patient care. Practical competency particularly among newly graduated nurses are interrelated, and deficits of any can cause difficulties, **(Yao et al., 2021 & Lang & Parkinson, 2023).** Since interpersonal and communicational skills are vital in the nursing profession, and it is sole in the development of nurses' clinical competence.

The PBL strategy can be an important vehicle to foster these skills **(Salari, Zarifi, and Tarmizi, 2021).**

Regarding the communication skills improvement after PBL training and a significant correlation between post PBL training performance and post PBL training communication skills were shown. These findings can be seen that the biggest learning gains for students during PBL tutorials are in problem-solving, contributions to the group, communication, learning skills, critical thinking, personal growth, and leadership **(Bruce et al., 2018 &Willman et al., 2020).**

Leal-Costa et al., (2020) studied the effect of communication skills training on self-efficacy and they showed that nursing professionals who have adequate communication skills feel more confident and more competent, fostering good interpersonal relationships with their patients, and therefore, their perceived general and specific self-efficacy improved as well. Moreover, communication skills are sole in the development of nurses' clinical competence and teaching communication skills is important to help nurses cope with a broad range of stressors in their daily interactions with patients, increasing their perceived self-efficacy.

Research has shown that nurses with higher levels of self-efficacy are more likely to provide effective patient care, communicate more confidently with their colleagues, and experience lower levels of burnout **Alquwez, (2023).** However, newly graduated nurses often struggle with low levels of self-efficacy, which can affect their communication skills and clinical competencies.

A study done by **Damodaran et al, (2023)** of the PBL strategy for OB/GY nursing confirmed an improvement in the clinical reasoning skill scores. Undergraduate nursing students should be sensitized with various workshops on PBL and should be given hands-on sessions to facilitate their clinical skills in the field of obstetric & gynecological nursing. In addition to, **TERKEŞ, (2022)** found that the level of professional competence can be affected by some personal characteristics. The researcher suggested that the findings obtained

in this framework should be considered by nurse instructors, nurse managers and institution managers in studies to develop holistic care.

Concerning problem-based learning (PBL) training and self-efficacy, **Ghani et al., (2021)** found that PBL empowers newly graduated nurses to take ownership of their learning process, boosting their confidence in problem-solving and decision-making. By successfully navigating through PBL scenarios and solving complex problems, nurses build confidence in their ability to apply theoretical knowledge to practical clinical situations. Through constructive feedback and reflection on their performance in PBL activities, nurses develop a sense of competence and self-efficacy in their clinical skills and decision-making abilities. Communication skills are practiced regularly as a part of PBL and are considered imperative to provide safe and efficient care for patients. PBL offers an approach to working with students' communication skills, which benefits the training of teamwork and collaboration.

The improvement of general self-efficacy in the present study with a significant statistical correlation after PBL training performance and after PBL training self-efficacy. Also, a significant statistical correlation was found between before and after PBL training self-efficacy. Likewise, this improvement of self-efficacy after the PBL training may be related to the improvement of communication skills which resulted in the study findings. Similarly to the present study findings, **Kawamoto Mitsuko et al., (2017) and Najafi & Nasiri (2023)** found that the perceived self-efficacy of newly graduated nurses is an important factor in their ability to provide high-quality care and adapt to the demands of the healthcare environment. Moreover, nurses with higher levels of self-efficacy are more likely to provide effective patient care, communicate more confidently with their colleagues, and experience lower levels of burnout. Conversely, newly graduated nurses who often struggle with low levels of self-efficacy, affect their communication skill and competence practice **(Serafin et al., 2022)**

Concerning the findings of PBL training clinical competency in the present study; an improvement on four competencies including nursing professional behaviors, general performance, core nursing skills and advanced nursing skills were assessed. In the same context; **Jamshidi et al., (2021), Mata et al., (2021) and Wang et al., (2021)** who confirmed that PBL promotes critical thinking and clinical reasoning among newly graduated nurses, enabling them to apply theoretical knowledge to practical patient care scenarios. PBL bridges the gap between theoretical knowledge and practical application, preparing nurses to confidently apply their skills in diverse clinical settings and adapt to changing healthcare environments. Besides, **Lin et al., (2018),** indicated that the PBL enhances clinical competency among newly graduated nurses. PBL had been shown to improve problem-solving abilities, critical thinking skills, clinical reasoning, and communication skills, all of which are critical components of clinical competency. New graduates who had been exposed to PBL during their nursing education were better equipped to adapt to changing healthcare environments, engage in evidence-based practice, and participate in professional development activities to improve their clinical skills and knowledge.

The hard and soft nursing skills competencies are essential for nurses to deliver high-quality care and contribute positively to patient outcomes. Hard nursing skills competencies provide the technical foundation necessary for clinical practice, while soft nursing skills competencies focus on interpersonal and communication abilities that foster therapeutic relationships and patient-centered care. It's crucial for nurses to continuously develop and refine both hard and soft skills competencies to adapt to changing healthcare environments and provide holistic care to patients (**Nursing and Midwifery Council, 2018).** Another study by **Othman et al., (2019)** revealed a significant effect of PBL on improving the soft skills of the students and enhanced group learning including overcoming communication conflicts.

In swift problem-based learning can positively influence communication skills, self-efficacy, and clinical competency among

newly graduated nurses by providing opportunities for active learning, collaboration, and application of knowledge in realistic clinical scenarios.

Conclusion

The research hypothesis in the present study has been proved. The newly graduated nurses' communication skills, self-efficacy and clinical competence levels were improved after the problem-based learning training. A significant correlation was found between marital status and residency, total post PBL training performance and total post PBL training communication skills, total pre PBL training self-efficacy and total post PBL training self-efficacy. Also, a significant correlation was found between total post PBL training performance and total post PBL training self-efficacy, total post PBL training communication skills and total post PBL training self-efficacy.

Recommendations:

- Adoption of the PBL approach in the nursing curriculum at the Military Technical Health Institute.
- Furthermore, more rigorous research on the influence of PBL on potential outcomes (i.e., improved communication skills, self-efficacy, clinical competency, NGNs satisfaction, and self-directed learning) are needed.
- Investigations on the long-term impacts of PBL in NGNs are necessary.

Conflict of interest statement

The authors declare that they have no conflict of interest.

References:

Allert, C., Dellkvist, H., Hjelm, M., & Andersson, E. K. (2021). Nursing students' experiences of applying problem-based learning to train the core competence teamwork and collaboration: An interview study. Nursing Open, 9(1). https://doi.org/10.1002/nop2.1098

Alquwez, N (2023). Nurses' self efficacy and well being at work amid the COVID-19 pandemic: A mixed-methods study. https://doi.org/10.1002/nop2.1752

Ancel, G. (2016). Problem-Solving Training: Effects on The Problem-Solving Skills and Self- Efficacy of Nursing Students. Eurasian. Journal of Educational Research; 64: 231-246.Available athttp:// dx. doi. org/ 10. 14689/ejer.2016.64.13ARA).

Baharum, H., Ismail, A., McKenna, L., Mohamed, Z., Ibrahim, R., & Hassan, N. H. (2023). Success factors in adaptation of newly graduated nurses: a scoping review. BMC Nursing, 22(1). https:// doi. org/ 10.1186/s12912-023-01300-1

Bandura, A. (1997). Self-Efficacy: The Exercise of Control. Journal of Cognitive Psychotherapy, 13(2), 158–166. https:// doi. org/10.1891/0889-8391.13.2.158

Bruce, J. C., Lack, M., Bomvana, N. M., & Qamata-Mtshali, N. (2018). Problem-based Learning: Nursing students' attitude, self-reported competence, tutorial performance and self-directed learning readiness. *Journal of Nursing Education and Practice*, *8*(10), 11. https://doi.org/10.5430/jnep.v8n10p11

Cansiz, M. (2019). The relationships between nursing students' self-efficacy, problem-solving skills and attitudes towards problem-based learning. Journal of Nursing Education and Practice, 9(7), 84-93. https://doi.org/10.5430/jnep.v9n7p84

Damodaran, L., Mahendra, J., Dave, P., Bedi, M., Mahendra, L & Aruna, S. (2023). Impact of Problem Based Learning (PBL) on Clinical Reasoning Skills of Nursing Students Little Mahendra. 10.17605/OSF.IO/WHNE4.

Demirören, M., Turan, S., & Öztuna, D. (2016). Medical students' self-efficacy in problem-based learning and its relationship with self-regulated learning. *Medical Education Online*, *21*(1), 30049. https:// doi. org/ 10.3402/meo.v21.30049

Fukada, M. (2018). Nursing Competency: Definition, Structure and Development. Yonago Acta Medica, 61(1), 001–007. https:// doi.org/10.33160/yam.2018.03.001

Ghani, A. S. A., Rahim, A. F. A., Yusoff, M. S. B., & Hadie, S. N. H. (2021). Effective Learning Behavior in Problem-Based Learning: a Scoping Review. *Medical science educator*, *31*(3), 1199–1211.

https:// doi.org/ 10.1007/ s40670-021-01292-0

Hyun, A., Tower, M., & Turner, C. (2022). The Current Contexts of Newly Graduated Nurses' Competence: A Content Analysis. Healthcare, 10(6), 1071. https:// doi. org/10. 3390/ healthcare10061071

Instructional Design Australia. (2020, February 16). *Applying problem based learning (PBL)*. Instructional Design Australia. https:// instructionaldesign. com. au/ pbl/

Jamshidi, H., Hemmati Maslakpak, M., & Parizad, N. (2021). Does problem-based learning education improve knowledge, attitude, and perception toward patient safety among nursing students? A randomized controlled trial. BMC Nursing, 20(1).https://doi.org/10.1186/s12912-021-00588-1

Joyce, B. L., Steenbergh, T., & Scher, E. (2010). Use of the Kalamazoo Essential Elements Communication Checklist (Adapted) in an Institutional Interpersonal and Communication Skills Curriculum. Journal of Graduate Medical Education, 2(2), 165–169. https://doi. org/ 10. 4300/ jgme-d-10-00024.1

Kawamoto Mitsuko, Takase Miyuki, & Imai Takiko. (2017). The Relationship between Learning Activities and Nursing Competence: A Comparison between Nurses with Different Educational Backgrounds. Nihon Shokugyo-Saigai Igakukai Kaishi. 2017;1:26-32. Japanese with English Abstract.

Ku, T. K., & Ha, M. (2016). The Application of Problem Based Learning in Undergraduate Nursing Education: A Strategy for Curriculum Reform. Journal of Biosciences and Medicines, 04(06), 52–59. https://doi. org/ 10. 4236/ jbm. 2016. 46008

LaMorte, W. (2022). *The Social Cognitive Theory*. Boston University School of Public Health. https:// sphweb. bumc. bu. edu/ otlt/ MPH-Modules/ SB/ Behavioral Change Theories/ Behavioral Change Theories5. html

Lang, K., & Parkinson, B. (2023). Problem-based learning in nurse education. Evidence-BasedNursing, 26(2),

Leal-Costa, C., Tirado González, S., Ramos-Morcillo, A. J., Ruzafa-Martínez, M., Díaz Agea, J. L., & van-der Hofstadt Román, C. J. (2020). Communication Skills and Professional Practice: Does It Increase Self-Efficacy in Nurses? Frontiers in Psychology, 11(1). https:// doi. org/ 10. 3389/ fpsyg. 2020. 01169

Leonard, J., Whiteman, K., Stephens, K., Henry, C., & Swanson-Biearmann, B. (2022). Improving Communication and Collaboration Skills in Graduate Nurses: An Evidence-based Approach. OJIN: The Online Journal of Issues in Nursing, 27(2), 1–8. https:// doi. org/ 10. 3912/ ojin. vol27no02 man03

Li, Y., Wang, X., Zhu, X., Zhu, Y., & Sun, J. (2019). Effectiveness of problem-based learning on the professional communication competencies of nursing students and nurses: A systematic review. *Nurse Education in Practice*, *37*(1), 45–55. https:// doi. org/ 10. 1016/ j. nepr. 2019. 04. 015

Liou, S.-R., & Cheng, C.-Y. (2013). Developing and validating the Clinical Competence Questionnaire: A self-assessment instrument for upcoming baccalaureate nursing graduates. Journal of Nursing Education and Practice, 4(2). https://doi.org/10.5430/jnep.v4n2p56

M. David Merrill. (2012). First Principles of Instruction. John Wiley & Sons.

Ma, H., Lin, L., Zhang, S., Lei, L., Huang, J., Lu, F., & Luo, Y. (2021). Exploring competencies of military nurses in general hospitals in China: a qualitative content analysis. BMC Nursing, 20(1). https://doi. org/ 10. 1186/s12912-021-00673-5

Mahnaz Moallem, Hung, W., & Dabbagh, N. (2019). *The Wiley Handbook of Problem-Based Learning*. John Wiley & Sons

Mata, Á. N. de S., de Azevedo, K. P. M., Braga, L. P., de Medeiros, G. C. B. S., de Oliveira Segundo, V. H., Bezerra, I. N. M., Pimenta, I. D. S. F., Nicolás, I. M., & Piuvezam, G. (2021). Training in Communication Skills for self-efficacy of Health professionals: a Systematic Review. Human Resources for Health, 19(1), 1–9. https://human-resources-

health. biomedcentral. com/ articles/10. 1186/s12960-021-00574-3

Najafi, B., & Nasiri, A. (2023). Explaining Novice Nurses' Experience of Weak Professional Confidence: A Qualitative Study. SAGE Open Nursing, 9(1), 237796082311534. https:// doi. org/ 10. 1177/ 237796082311153457

Nursing and Midwifery Council. (2018). Standards for Competence for Registered Nurses. In *Nursing and Midwifery Council* (p. 9). Nursing and Midwifery Council. https://www.nmc.org.uk/globalassets/sitedocuments/standards/nmc-standards-for-competence-for-registered-nurses.pdf

Othman, H., Salleh, B. M., & Deep, S. (2019). Study on problem-based learning towards improving soft skills of students in effective communication class. *International Journal of Innovation and Learning*, 25(1), 17. https://doi.org/10.1504/ijil.2019.10016630

Rider, E. A., Hinrichs, M. M., & Lown, B. A. (2006). A model for communication skills assessment across the undergraduate curriculum. Medical Teacher, 28(5), e127–e134. https://doi. org/ 10. 1080/ 01421590600726540

Rider, E. A., Nawotniak, R. H., & Smith, G. (2007). A Practical Guide to Teaching and Assessing the ACGME Core Competencies. HC Pro, Inc.

Salari, M., Zarifi, A., & Tarmizi, R. A. (2021). Effect of Problem-Based Learning on Communication Skills of Undergraduate Nursing Students. Journal of Clinical Care and Skills, 2(1), 21–27. https://doi. org/ 10. 52547/ jccs.2.1.21

Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, Measures in health psychology: A user's portfolio. Causal and control beliefs (pp. 35-37). Windsor, UK: NFER-NELSON.

Serafin, L., Strząska-Kliś, Z., Kolbe, G., Brzozowska, P., Szwed, I., Ostrowska, A., & Czarkowska-Pączek, B. (2022). The relationship between perceived competence and self-esteem among novice nurses – a cross-sectional study. Annals of Medicine, 54(1),484–494. https://doi. org/ 10. 1080/ 07853890.2022.2032820

Servant-Miklos, V. F. C. (2019). Fifty Years on: A Retrospective on the World's First Problem-based Learning Programme at McMaster University Medical School. Health Professions Education, 5(1), 3–12. https:// doi. org/ 10. 1016/j.hpe.2018.04.002

Sharma, S., Saragih, I. D., Tarihoran, D. E. T. A. U., & Chou, F.-H. (2023). Outcomes of problem-based learning in nurse education: A systematic review and meta-analysis. Nurse Education Today, 120, 105631. **https://doi.org/10.1016/j.nedt.2022.105631**

Syarafina, D. N., Jailani, & Winarni, R. (2018). The application of problem-based learning to improve students' self-efficacy. *AIP Conference Proceedings*. https:// doi. org/ 10. 1063/1.5054428

TERKEŞ, N. (2022). How Professionally Do New Graduate Nurses Feel Professionally Competent? Sağlık Akademisi Kastamonu. https://doi.org/10.25279/sak.1040286

Valle, R., Petra, lleana, Martinez-Gonzaez, A., Rojas-Ramirez, J. A., Morales-Lopez, S., & Pina-Garza, B. (1999). Assessment of student performance in problem-based learning tutorial sessions. Medical Education, 33(11), 818–822. https://doi.org/10.1046/j.1365-2923.1999.00526.x

Wang, J., Zheng, Q., Song, W., & Wei, L. (2021). The Effect of Nursing Students' Self-Efficacy on Patient-Centered Communication During the COVID-19 Pandemic: The Mediating Effect of Learning Burnout. *Frontiers in Psychiatry*, *12*. https:// doi. org/ 10. 3389/ fpsyt. 2021. 787819

Willman, A., Bjuresäter, K., & Nilsson, J. (2020). Newly graduated registered nurses' self assessed clinical competence and their need for further training. Nursing Open, 7(3). https://doi.org/10.1002/nop2.443

World Health Organization. State of the World's Nursing Report—2020: Investing in Education, Jobs and Leadership. World Health Organization; Geneva, Switzerland: 2020.