



Review

Barriers in performing physical assessment among nursing students: An integrative review

Jestoni D. Maniago^a, Evelyn E. Feliciano^{a,*}, Adelina M. Santos^a, Cyrelle L. Agunod^a,
Cris S. Adolfo^a, Brian A. Vasquez^a, Abdulrhman Albougami^a, Joseph U. Almazan^b

^a Department of Nursing, College of Applied Medical Sciences, Majmaah University, Al-Majmaah, 11952, Kingdom of Saudi Arabia

^b Nazarbayev University School of Medicine, Nazarbayev University, Nur-Sultan, 010000, Republic of Kazakhstan

ARTICLE INFO

Article history:

Received 2 December 2019

Received in revised form

7 December 2020

Accepted 16 December 2020

Available online 19 December 2020

Keywords:

Clinical competence

Nursing education

Physical assessment

Problem solving

ABSTRACT

Objectives: This study aimed to identify barriers in performing physical assessments among nursing students through integrative review study.

Methods: The literature were searched in Medline, CINAHL, ScienceDirect, Web of Science, ProQuest, and Taylor & Francis Online using the descriptors barrier, physical assessment, nursing student et al. Only English-language and peer-reviewed journal articles were included, and there were no year restrictions.

Results: Twelve articles were selected for review. Two aspects were extracted: the barriers included personal challenges, challenges related to nursing education, challenges related to clinical practice; establishing competency-based education learning as a method to reduce physical assessment barriers. Student competencies and experiences were influenced by various factors that collectively hindered their successful performance of physical assessments.

Conclusions: The review findings provide valuable insights into the complex issues involved in the performance of physical assessments and guidance for improvement in practice. A collaborative effort should be made to address the issues often faced by nursing students in performing routine physical assessments. Also, more constructive and competency-based teaching methods should be integrated into academic and clinical settings.

© 2020 The authors. Published by Elsevier B.V. on behalf of the Chinese Nursing Association. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

What is known?

- Student physical assessment competencies were influenced by various factors.

What is new?

- The review provides insights on the complex issues in performing physical assessment and practice. A collaborative effort should address issues in performing a physical assessment.

1. Introduction

The ability to perform a physical assessment is an essential

clinical skill, and physical assessments are a central component of nursing practice [1,2]. Physical assessment is defined as the process in which a health care professional examines a patient's body for signs and symptoms of the disease. To complete this process, one must have competency in the core abilities that are required for fulfilling one's role as a nurse [3]. Clinical nursing competency is defined as a complex integration of knowledge and nursing skills and the ability to apply them to clinical practice [4]. The level of clinical nursing competency may be a determining factor in the quality of the care provided. Therefore, nurses and future nurses should have a thorough understanding of the complexity of physical assessments in terms of patient safety and care quality.

Furthermore, in a complex clinical practice setting, new graduate nurses must be equipped with the right core skills to promote optimal patient care [5]. One of the nursing skills taught at universities is physical assessment, a key element in nursing education, and clinical practice. For the past decade, physical assessment has been an integral part of the nursing field [6]. However, emergent evidence has demonstrated problems among nursing students

* Corresponding author.

E-mail address: e.feliciano@mu.edu.sa (E.E. Feliciano).

Peer review under responsibility of Chinese Nursing Association.

in effectively performing their clinical skills, which has resulted in difficulty in evaluating their clinical learning [7–9]. Furthermore, there is debate regarding whether educational institutions are imparting the skills required in the nursing profession. It has been suggested that comprehensive patient health assessment is one of nursing foundations [10]. However, some researchers have argued that historically, physical assessments have troubled the nursing profession. The gap between theory-based learning and experiences in clinical practice has resulted in anxiety, doubt, and confusion among nursing students [11].

It has been reported that certain physical assessment skills or techniques are no longer being demonstrated or practiced in the clinical course [12]. One study provided an in-depth analysis of the use of physical assessment skills among registered nurses and found that only 57% of schools trained their students in all 121 physical assessment skills examined [13]. Other empirical research has found that improvements in technology, time constraints, and uncertainty that stem from a lack of confidence affects the adequacy of physical assessments. One study found that although nursing students are oriented and educated on physical assessments, they do not often perform them in clinical settings [11]. The same study identified dependency on others, ward culture, and lack of influence on patient care as barriers in performing physical assessments. Another study demonstrated that evaluating students' physical assessment competency is challenging because of difficulties in deciding what to assess and whether competency should be assessed universally, and problems related to the lack of objectivity of assessment strategies wherever socialization processes may occur [14]. This finding suggests that students can perform physical assessment poorly, which contributes to clinical errors. Another study found that educators were challenged in their efforts to steer students toward clinical practice settings that provide adequate clinical experience [15]. Furthermore, training hospitals lack sufficient equipment and have shorter patient hospital stays [16]. Hence, because of physical assessment barriers, students are not prepared to receive applicable clinical experiences. Understanding physical assessment barriers among nursing students allows a more detailed assessment of patient care quality in the clinical setting.

Reducing physical assessment barriers, continuing physical assessment exposure, and enhancing the quality of planning and promotion of this skill to nursing students could increase self-confidence and lead to the safer assessment of patient health status [17]. Also, the reinforcement of quality teaching and nursing skills are required for nursing students to perform comprehensive health assessments utilizing core competencies without overreliance on technology [3]. Service quality on the ward is based heavily on meeting the needs of patients. Thus, future nurses should continuously review their basic physical assessment knowledge to improve patients' experiences with the health care system.

The problems and issues related to teaching physical assessment skills to nursing students remain unclear and unresolved [11]. These problems and issues are deeply entrenched in nursing education. However, little research on reducing the physical assessment barriers in clinical and classroom settings has been conducted [18]. The literature raises fascinating questions about the challenges in performing physical assessments and the related barriers in education and practice. While important advances have been made in promoting physical assessment in clinical practice, limited information is currently available on the barriers in conducting physical assessments and few rigorous studies have focused on nursing students [3]. Identifying the challenges of nursing students in performing clinical skills, particularly physical assessments, may enhance instruction delivery and facilitate more engaging and

student-centered learning.

A comprehensive literature review facilitates the aggregation of diverse literature from various contexts about challenges encountered by nursing students in performing physical assessments. The results of this review may contribute to the development of evidence-based nursing strategies that promote competency and the use of sound judgment in the performance of physical assessments in the clinical practice setting.

What are the barriers in conducting physical assessments on patients among nursing students in both the classroom and clinical settings? This review aimed to identify the barriers to performing physical assessments among nursing students. This review sheds light on the nursing student's situation about physical assessments' performance in both the classroom and clinical settings.

2. Material and methods

2.1. Search strategies

Standard search strategies using electronic databases were employed in a search for the relevant literature on physical assessment among nursing students [19]. Six electronic databases were used in the search: Medline, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Science Direct, Web of Science, Nursing & Allied Health Database (ProQuest), and Taylor & Francis Online. Keywords were identified using a thesaurus of terms used in the searched databases and MeSH (Medical Subject Headings) terms. The keywords, with truncation and Boolean logic, used for all database were as follows: barrier* or hindrance* or obstacle* or difficulty* challenge* AND physical assessment or health assessment or physical examination AND nursing student* or future nurse*. Articles were considered for inclusion if the study explored the theory or practice of physical evaluation among student nurses, or barriers in performing physical assessments in clinical and classroom settings among this group.

2.2. Inclusion and exclusion criteria

The inclusion criteria were as follows: articles written in the English language and articles published in peer-reviewed journals. There was no year restriction to examine the historical perspective of nursing students' physical assessment performance and its perceived barriers. The exclusion criteria were as follows: articles in press; conference proceedings; abstracts; articles that were not relevant to the aim of the review; gray literature; unpublished manuscripts (abstracts or dissertations); non-English language articles; studies with non-nursing student participants; and editorial pieces.

2.3. Search outcomes

Abstracts of the articles were matched against the inclusion and exclusion criteria of the review. A total of 1,072 potential articles were identified. Five hundred seventy-three articles remained after the duplicates were removed. In the articles' screening, 440 failed to meet the inclusion criteria (98 were not in English, and 342 had been published in non-peer-reviewed journals). Then, 125 articles were excluded for failing to meet the inclusion criteria because these studies involved non-nursing students. Among the eight full-text articles that met the inclusion criteria, five were on quantitative research, two were on mixed-methods research, and one was on qualitative research. The Saudi Digital Library was used for the manual search of potential articles cited in the eight articles that had been selected in the original search. The search revealed nine more potential articles. After reading the abstract and full text of

each, four of the nine articles from the Saudi Digital Library fit the inclusion criteria, resulting in 12 articles. Disagreements between the two authors were resolved by consensus [19]. A flow diagram illustrating the article search process is presented in Fig. 1.

2.4. Quality appraisal and data synthesis

A literature review using descriptive data synthesis of previously reported findings was used to conduct this investigation [20]. The checklist is one of the most often used tools to appraise the methodological quality of research articles. The checklist used in this review consisted of 10 questions for the criteria, and the scale was coded with “Yes” (score of 2), “Somewhat” (score of 1), and “No” (score of 0) response options. The sum of the scores for “Yes” responses was used to determine the quality score index. In this review, the quality score ranged from 75% to 95% out of a possible score of 100%.

Table 1 presents the quality scores of the selected articles. Two articles had the highest quality score (95%) [11,21]. Given the differences in research design, samples, and data collection methods, a meta-analysis of the data was not possible. The researchers performed data extraction and analysis. First, data were extracted from the articles (author/year/country, design, study aim, sample population, data collection and analysis, and key findings). Second, the selected articles were read, and the data were coded independently until the final themes were identified. The articles were reviewed for over 1 month and revisions were made. Initial themes were refined until the final themes emerged.

The final analysis was performed by the researchers. Results were presented according to the four themes. The review consisted of various empirical sources, and no explicit criteria for the assessment of the quality of these various studies with diverse methodologies exist [19]. A comprehensive quality appraisal of each study's methodological structure was performed, and a set of criteria was applied to demonstrate the quality of the selected papers [20].

3. Results

The results are presented under the four main extracted themes: personal challenges, challenges related to nursing education, challenges related to clinical practice, and establishing competency-based education learning.

3.1. Personal challenges

Current research evidence shows that among nursing students, the perceived barriers in the performance of physical assessment skills include lack of confidence, lack of preparedness, worry, and anxiety [11,17,22]. For instance, an assessment of the barriers to physical assessment skills among nursing students in Saudi Arabia found that 66.02% of students were not confident in their ability to perform physical assessments in the classroom, and 60.19% were not confident in their ability to perform physical assessments in clinical settings [11]. In the same study, 74.76% of students constantly worried about performing physical assessments in the

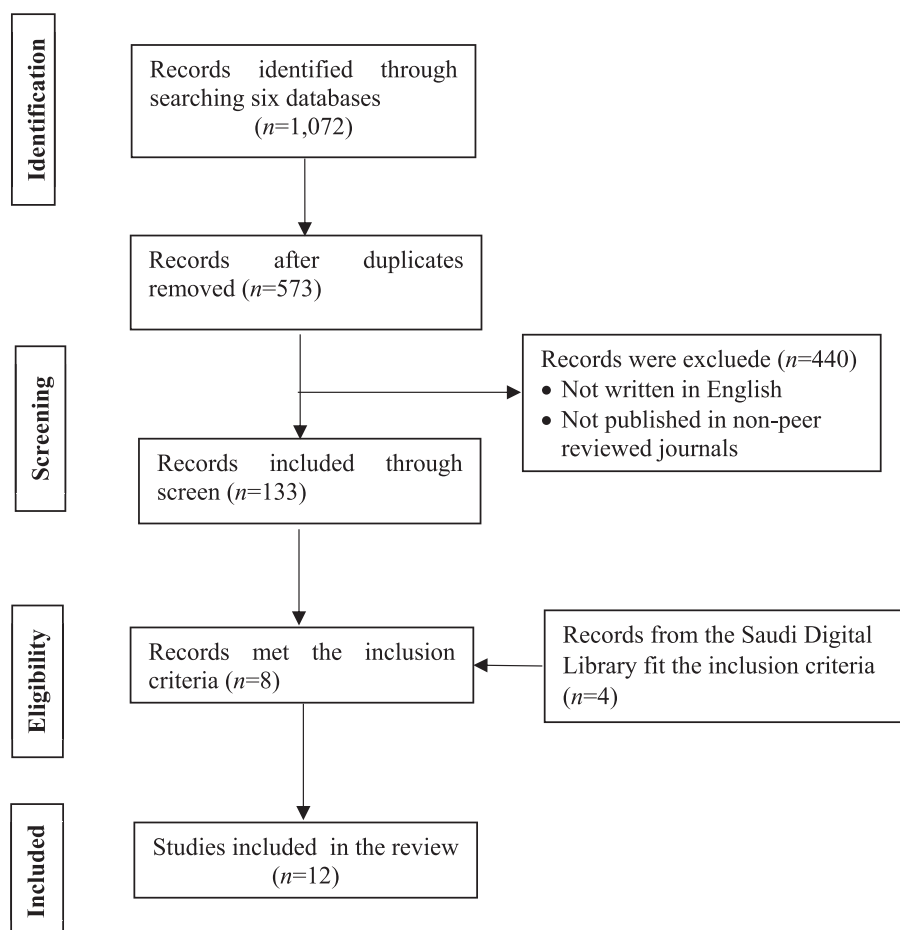


Fig. 1. Search flow process for the integrative review.

Table 1

Details of studies in this review.

Author, year, country	Aim of the study	Design and methods	Sample and settings	Key findings	Quality score
Alamri & Almazan 2018 [11] Saudi Arabia	To examine the barriers to physical assessment skills among nursing students	- Quantitative, cross-sectional - A questionnaire developed by Douglas et al. (2014) - Independent t-test	206 convenience sample of 2 nd year, 3rd year, 4th year nursing students - Government university in Arab Peninsula	- Findings revealed that more than half of the respondents reported that lack of time and interruptions, lack of confidence, lack of influence on patient care are perceived barriers to physical assessment. - Further, reliance on others and technology, ward culture, lack of influence on patient care are significantly associated barriers in performing a physical assessment.	95
Dela Cruz et al., 2014 [15] Philippines	To determine the level of competence and confidence of their knowledge and skills in performing a physical examination	- Quantitative, descriptive - A non-standardized questionnaire - Pearson correlation	208 convenience sample of 3rd year and 4th year nursing students - Academic institution	- The better the knowledge, the more confident to perform skills tasks with a higher level of skills performance proficiency. - A significant correlation exists between perceived knowledge and performance competency, but not between educational levels, which indicates the importance of increasing student assessment practice and skills feedback to continually raise their overall competency levels throughout their educational experience.	90
Douglas et al., 2015 [16] Australia	The purpose of this study was to examine the pattern and correlates of physical assessment skill utilization by final semester nursing students	- A cross-sectional - A standardized questionnaire developed by Giddens' (2007) - t-tests and analyses of variance and open-ended questions deductively coded	208 convenience sample of nursing students - Academic institution	- Only five clinical skills were used every time students practiced physical assessment. Core skills reflected inspection or general observation of the patient; none involved complex palpation, percussion, or auscultation. Skill utilization was also shaped by specialty area. - Most skills (70%) were, on average, never performed or learned and students perceived nursing physical assessment was marginalized in both university and workplace contexts. Lack of confidence was, thus, a significant barrier to the use of skills.	85
Leh .2011 [17]USA	To identify and describe nursing students' preconceptions of the community health clinical experience as they begin the clinical rotation	- Qualitative, exploratory, and descriptive design - Focus group interviews - Qualitative content and thematic analysis	42 purposive sample of senior BSN students - Community setting	- Findings presented that nursing students felt insecure and unprepared before their patient assessment in the community. - Moreover, communicating with clients was perceived as a challenge by many students.	85

(continued on next page)

Table 1 (continued)

Author, year, country	Aim of the study	Design and methods	Sample and settings	Key findings	Quality score
Dearmon et al., 2012 [21] USA	To evaluate the effect of a simulation-based orientation for a nursing foundation clinical course on knowledge acquisition, anxiety, self-confidence, and student satisfaction in BSN students preparing to begin their first clinical experience	• Mixed-method, quasi-experimental • A non-standardized questionnaire and standardized instruments developed by Cohen, Kamarck, & Mermelstein (1983); and Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, (1983) • Pearson's correlation coefficient, regression analysis, paired <i>t</i>-test, and Wilcoxon tests	• 50 convenience sample of first-year BSN students • Academic institution	• A significant positive correlation, indicating that those with a higher inherent anxiety trait are also likely to have a higher anxiety level, which is aggravated by the thought of performing the procedure. • Students appreciated the relaxed and supportive learning environment and the opportunity to "practice with a real patient" prior to entering the clinical experience.	95
Palese et al., 2017 [22] Italy	To describe nursing students' perceptions and to explore conditions influencing effectiveness on learning processes during the night shift	• An explanatory mixed-method, cross-sectional study (1st phase) and descriptive phenomenological (2nd phase) • A non-standardized questionnaire, and open-ended question interview	• 352 convenience sample of nursing students (1st phase), and 9 nursing students purposively interviewed (2nd phase) • Clinical setting	• Findings showed that physical assessment competence was significantly inferior among night shift students as compared to day shift students, while the perception of wasting time was significantly higher among night shift students compared to their counterparts. • Stress and anxiety were reported more often among those students who attended day shifts (25.4% and 15.2%, respectively) in comparison to those also having night shifts (17.0% and 10.6%, respectively). • In addition, night shift students reported boredom significantly more often (23.5%) compared to day shift students ($P = 0.001$); insomnia (37; 12.6%), disorientation/confusion (32; 10.9%) and clinical instability (28; 9.5%) were the most frequent problems encountered by students during night shifts • Findings from the qualitative phase showed night shifts are experienced by students as a "time capable of generating clinical learning".	90
Paula-O'Neill et al., 2013 [23] USA	To determine if pediatric clinical and simulation settings offer the opportunity to practice the six competencies set forth by the Quality and Safety Education for Nurses (QSEN) initiative	• Quantitative, observational • Time-on-task or clinical observation • Cohen's <i>d</i>	• 13 convenience sample of junior-level baccalaureate students • Clinical setting	• Students spend more time in the hospital providing patient-centered care than in the simulation laboratory. The primary activities were, in order of total time, (a) patient education, (b) documenting, (c) establishing rapport with the patient and patient's family, and (d) physical assessment. • Students have limited opportunities to practice assessment skills in the simulation laboratory.	75

Table 1 (continued)

Author, year, country	Aim of the study	Design and methods	Sample and settings	Key findings	Quality score
Sharif & Masoumi.2005 [24]Iran	To analyze the data the method used to code and categories focus group data	• Qualitative, focus group • Focus groups interview using 9 open-ended questions • Coding and categorizing until new themes arise	• 90 purposive sample of nursing students • Clinical setting	Less than 10 min during a 3.5-h clinical period or simulation laboratory engaged in (a) quality improvement (2.31 and 0.62 min, respectively), (b) evidence-based practice (5.92 and 0.54 min, respectively), and (c) informatics (2.96 and 0 min, respectively). Four themes emerged "students' point of view," "initial clinical anxiety", "theory-practice gap", "clinical supervision", and professional role", affecting physical assessment (clinical competency skills).	90
O'Lynn & Krautscheid .2014 [25]USA	To compare student outcomes between those who received an intimate touch laboratory with subsequent clinical experience (intervention group) and those who received only the clinical experience (control group)	• Quantitative, quasi-experimental • A non-standardized questionnaire • Pearson's correlation coefficient	• 17 male BSN students in intervention group and 15 male BSN students in control group • Academic institution	• The intervention students had significantly more comfort and less rigid gender requirements for intimate touch and demonstrated intimate touch better when providing perineal assessment and hygiene, compared with control students. • The need for exposure and the increased amount of time required to complete the perineal assessment may increase the risk of demonstrating less-than-optimal behaviors.	90
Wu et al., 2014 [26]China	To evaluate the effectiveness of nursing core competency standard education in undergraduate nursing training	• Quantitative, experimental • A non-standardized questionnaire • Independent t-test	• 42 students receiving conventional teaching methods in control group and 31 students receiving nursing core competency education in experimental group • Academic institution	• The performance in the health information collection, physical assessment, scenario simulation, and communication in the experimental group were significantly higher than those of the control group. • Nursing core competency standard education is helpful for the training of nursing students' core competencies.	85
Fan et al., 2015 [27]China	To examine the effects of competency-based education on the learning outcomes of undergraduate nursing students	• The quantitative, quasi-experimental design • Objective Structured Clinical Examination, Self-Evaluated Core Competencies Scale, (Simpson and Courtney, 2002), Metacognitive Inventory for Nursing Students questionnaire (Hsu, 2010) and academic performance • Independent t-tests and chi-square tests	• 312 convenience sample of nursing students specifically 163 students received competency-based education in experimental groups and the 149 students of control group received traditional instruction in a medical-surgical nursing course • Academic institution	Students who received competency-based education had significantly higher academic performance in the medical—surgical nursing course and skill competency than did the control group. Required core competencies and metacognitive abilities improved significantly in the competency-based education group as compared to the control group after adjusting for covariates	90
Yastik & Anthony (2007) [28]USA	To describe an innovative approach in the delivery of a health assessment course	• Qualitative, observational • A structured sequence of different learning	• 115 purposive sample of second-degree BSN students • Academic institution	• Findings revealed that students achieve excellent performance when various learning	75

(continued on next page)

Table 1 (continued)

Author, year, country	Aim of the study	Design and methods	Sample and settings	Key findings	Quality score
	for accelerated nursing students	activities, use of active forms of learning, and use of fair assessment, grading systems, frequent and immediate feedback		activities were employed during the 2-week health assessment format. • Students quickly embraced the fast-paced format and were able to feel very comfortable starting the next clinical exposure.	

Note: BSN = baccalaureate nursing.

classroom, and 37.86% of students constantly worried about performing physical assessments in clinical settings.

One US study explored nursing students' physical assessment perceptions toward their community health clinical experience [17]. The study found that nursing students felt insecure and unprepared before conducting physical assessments on the community's patients. Physical assessment concepts were considered by the students to be vague, unclear, and confusing. In one Italian study, nursing students were found to experience more stress and anxiety during night shifts than during day shifts [20]. The physical assessment competence of night-shift students were considerably lower than that of the day-shift students. Night-shift students demonstrated boredom significantly more often than day-shift students, along with disorientation/confusion, clinical instability, and insomnia. The study also found that as students enter the clinical rotation, the better the physical assessment preparation strategies, the greater the confidence and anxiety reduction.

3.2. Challenges related to nursing education

Four studies highlighted the obstacles to physical assessment skills that were related to nursing education [11,16,23,24]. Two of the studies found that the lack of nursing role models and the gap between theory and practice affected students' physical assessment performance [11,24]. Students perceived clinical instructors as having less competency compared with staff nurses. The gap between theoretical knowledge and actual practice was related to inadequate clinical teaching processes that led to a need for nursing curriculum revision [24]. A cross-sectional study in Australia on 208 nursing students found that only five skills were consistently used among the 126 physical assessment skills surveyed (breathing assessment, mental status assessment using the Glasgow Coma Scale, capillary refill inspection and palpation, palpation on extremities, and temperature assessment).

These results may be attributable to the gap between theory and actual practice in skills assessment [11,24]. Students tend to focus more on basic inspection and less on complex percussion, auscultation, and palpation techniques during physical assessments. According to the quantitative study, students spent less than 10 min on average during a 3.5-h physical assessment period or simulation laboratory engagement on the more complex techniques [23]. Although they had constant exposure to physical assessment techniques in the simulation laboratory, they still experienced uncertainty in real-life scenarios [11]. Such uncertainty could cause anxiety during clinical practice, which could affect physical assessment performance [21,23]. The gap between theory and practice and students' limited physical assessment practice may lead to inadequacies in physical assessment skills and increased diagnostic errors.

3.3. Challenges related to clinical practice

Four studies explored the challenges related to clinical practice [11,16,17,23]. In two US studies, nursing students reported poor communication skills and limited practice opportunities [17,23]. Two other studies used the same standardized tool, which was a seven-subscale measure [3,11,16]. A cross-sectional study conducted at a government university in Saudi Arabia used this tool [11]. In that study, students were asked to identify their perceived physical assessment barriers. The students reported that four of the seven subscales (reliance on others, ward culture, reliance on technology, lack of time and interruption, and lack of influence on patient care) were barriers in performing physical assessments in the clinical setting. In another study, students rated the influence of specialty area and lack of confidence the highest. In contrast, reliance on others and technology and perceived lack of influence on patient care scored lowest [16]. In one US study that conducted focus group discussions, student nurses reported that they were unprepared to deliver care in the community health care setting because of poor communication between clinical instructors and students [17]. Italian night shift nursing students were more satisfied than day shift students because of the number of hospital beds, staff reduction, and less understanding of the nursing role [22]. Overall, all studies suggested that physical assessment barriers could delay recognition of patients' current health status and compromise student critical thinking and care delivery.

3.4. Establishing competency-based learning education

More than half of the studies recommended a variety of competency-based learning education methods to reduce physical assessment barriers. For instance, the effect of simulation-based physical assessment orientation on the anxiety level and self-confidence of nursing students during their first clinical experience in the United States was evaluated in one study [21]. That study found that students with more clinical experiences were more confident and experienced less anxiety than students undergoing their first hands-on clinical experience. Another US study suggested that the use of touch improved physical assessment skills and increased confidence compared with the use of standard clinical skills only [25]. Similarly, in one study, US students received "hands-on" experience through simulation and video presentation of complete physical assessments for two weeks. Although initially skeptical of the above activities, the study found that the students quickly embraced the physical assessment concepts. Thus, the use of equipment in the skills laboratory that was similar to that of hospitals enhanced nursing students' learning [23].

In China, close supervision during the physical assessment is considered essential in guiding nursing students' theoretical knowledge and practical skills [26]. Another study was conducted

to explore the Iranian nursing student's perception of barriers in physical assessment [24]. That study suggested that incorporating theory and practice into the professional role would result in students feeling qualified to care for patients' needs. One study, conducted in the Philippines suggested that students be given more opportunities for assessment practice and feedback, which could create an environment that supports student inquiries and without fear of negative consequences [15]. This finding was consistent with those of a mixed methods, a quasi-experimental study that demonstrated that maintaining a relaxed and supportive learning environment during physical assessment simulation-based orientation is an appropriate teaching strategy to improve clinical competency [21]. In another US study, it suggested that good effective communication plays a significant role in building self-confidence [17]. Another study conducted in China found that nursing students who experienced competency-based learning had better physical assessment skill competencies than students enrolled in a traditional course. The study concluded that competency-based education (CBE) improved student core competence levels and metacognition skills [27]. Therefore, educators should provide the most constructive, confidence-building environment possible. Such support would encourage nursing students to ask questions and feel safe. Educators should willingly and supportively guide the students in the process of finding answers while honing their knowledge and skills.

Although the reviewed articles focused on the improvement of clinical core competencies in performing physical activities, the core competency levels that need to be identified are unclear. Moreover, physical assessment competencies may differ during night and day shifts because of night shift peculiarities. Additionally, all reviewed studies are unclear on how to create a constructive confidence-building and supportive environment. Nevertheless, this view was supported in other studies that highlighted the relevance of case scenario simulation and training in the improvement of clinical nursing performance for disaster preparedness [26,28].

4. Discussion

This review aimed to describe research on the barriers in performing physical assessments among nursing students. It also shed light on nursing students' role in performing physical assessments in classroom and clinical settings. The four extracted themes are discussed below: First, nursing students experienced personal challenges in performing physical assessments. Three studies claimed that lack of confidence, insecurity, lack of preparedness, worry, and anxiety were perceived barriers in performing physical assessments [11,17,22]. The personal challenge level is high when students move to a new and unfamiliar clinical setting with predetermined expectations and ideas that may be accurate or faulty [17]. Such preconceived ideas and expectations can be a source of stress, worry, anxiety, and decreased self-confidence, which affects physical assessment performance. In another study, it was found that as students progress in an academic institution, their stress and anxiety increase, and their self-esteem decreases [29]. Therefore, continuous demonstration and reinforcement of physical assessment skills among students should always be part of the skills courses in the integration of CBE in both education and clinical settings. However, limitations should be acknowledged and considered when utilizing the three studies' findings (i.e., use of only one institution in the examination, use of the self-reported interview method, and convenience sampling). These factors limited the generalizability of the results. Personal challenges are subjective and involve a range of emotions. Hence, further studies could use a mix of data-collection methods to illuminate this complex phenomenon of student physical assessment performance.

Second, nursing education institutions are constantly striving for more competency-based curricula to prepare future nurses with the profession's required skills. However, four studies have reported on the barriers of physical assessment skills experienced in nursing programs [11,16,23,24]. Although students have opportunities to develop physical assessment skills during simulation training and clinical reasoning practice, the development of effective communication skills is neglected. As nursing education focuses more on simulation equipment rather than on real patient care, there is less nurse-patient interaction. This method should also allow educators to constantly observe and accompany the student as they conduct the physical assessment. Students may behave differently during physical assessment practice when an instructor is observing them. Physical assessment is a complex process that raises concerns regarding the opportunity to practice and the perceived disconnection between education and practice. Also, most physical assessment skills are used primarily by the physician, which limits the opportunity of nursing students to practice them [16]. This situation leads to questions regarding the specific physical assessment skills that should be taught and how such skills can be practiced more effectively. Nevertheless, the limited number of physical assessment skills learned and used by students could reflect a restricted or diminishing nursing skill base. It may be that other areas of physical assessment skills need to be revisited in the nursing curriculum. Therefore, nursing curriculum designers, schools of nursing, policymakers, and other stakeholders should be involved in the development of innovative strategies to further improve students' experiences in performing physical assessment skills. Nevertheless, these three studies' findings should be interpreted carefully, given that the sample sizes are small. Thus, future research should examine other physical assessment components using larger samples.

Third, this review's findings indicated that students' physical assessment skills in the classrooms were rarely used in clinical practice. Future nurses should have a foundation of physical assessment skills that can be applied to clinical practice. However, the limited opportunity to practice in classrooms may explain the lack of application to practice. Other barriers in physical assessment (e.g., reliance on others and technology, ward culture, and lack of influence on patient care) were reported in clinical settings [11]. Unlike classroom settings, clinical exposure occurs in a complex clinical learning environment [13]. Certain nursing education schools have sophisticated equipment that is comparable to that found in clinical settings [11]. The use of such equipment may improve physical assessment performance in clinical practice. Although the study had successfully identified physical assessment barriers among nursing students, certain limitations, such as it being conducted in one clinical setting, could limit its generalizability. Also, most physical assessment skills are carried out by physicians, which can make the physical assessment skills of nurses redundant [3]. Clear policies that define physicians' and nurses' roles in conducting physical assessments on patients (without risking their welfare) should be developed. This situation raises issues that should be making as future nurses' appropriate role in conducting physical assessments on patients and the factors that affect physical assessment implementation. This review's findings suggest that physical assessment skills' barriers depend on equipment availability and the skills learned during training. However, other teams in the clinical setting appear to be more influential than class lectures.

Most notably, this review's finding provides evidence of the barriers in physical assessment among nursing students. Hence, establishing competency-based learning is crucial to the development and implementation of the necessary physical assessment skills. For instance, the promotion of physical assessment skills

through theory and application (lecture and clinical learning) could foster the essential skills and increase students' confidence in their ability to assess patients' health status during physical assessments effectively. Most of the literature focused on continuous exposure in a learning environment despite the lack of available equipment and supplemented equipment with proper physical assessment knowledge and skills that could enhance student confidence. However, several studies were unclear on the specific type of competency-based teaching methods necessary to improve learning and transform it from theory to practice. Nevertheless, this review's findings supported the integration of theory and practice, with constant clinical supervision to increase the competency of nursing students in providing patient care.

Implications for education and practice

The nursing curriculum's repercussions call for transitioning from teacher-centered instruction to student-focused learning and revisiting physical assessment contents. Clinical instructors should act as facilitators of learning and not as sole sources of information. Students should be encouraged to perform self-paced activities in which they can explore topics in greater depth and create learning opportunities. A CBE approach can also improve students' core competency levels and metacognition skills. This approach is a shift from the traditional model of classroom instruction. As a teaching method, CBE allows for the evaluation of students' commonly after students have mastered the competency to proceed to the next level. Students can skip to the next level if they have already demonstrated mastery of the competency. Clinical instructors will also have more time to focus on improving each competency and communicating with students to encourage them to verbalize their concerns and issues. Consequently, students will develop self-esteem and confidence in performing clinical skills such as physical assessments. Consequently, clinical instructors can focus on students' learning needs, which often reveals problems, such as anxiety, low self-confidence, and doubt in performing clinical nursing skills.

Clinical skill competence is determined by the educational foundation of professional nurses. Hence, the preparation of nursing students is therefore crucial in developing competent future nurses. Patient safety is highly dependent on how effectively a nurse can perform clinical skills. Thus, the clinical environment will have a strong impact on the development of students' competencies in performing clinical skills. The instructional focus during students' clinical practice should be integrated into schools or universities' teaching approach. There should be clear communication between clinical instructors and students, so that related problems or concerns can be raised and addressed appropriately. Debriefing sessions and post-conference are effective methods of providing students with the opportunity to communicate and improve clinical performance, especially on basic nursing skills such as physical assessments. The clinical environment may also be influenced by its staff and schedule. Although staff nurses' attitudes toward nursing students and patient admissions are beyond the control of nurse managers, continuous reinforcement through assistance and communication with clinical instructors and nursing students can identify barriers in performing physical assessments and other nursing procedures. Poor professional relationships between staff nurses and nursing students may result in low clinical performance and poor outcomes in inpatient care.

5. Conclusions

This integrative literature review provided substantive information on the barriers encountered by nursing students in

performing physical assessments. Student competencies and experiences were influenced by various factors that collectively hindered their performance. Those challenges are referred to as student-related personal factors. The factors were based on emotional states affected whenever students felt anxious, lacked confidence, and worried. Emotional states may be preconceived because of prejudice or maybe experience spontaneously during a physical assessment because of unexpected circumstances. Several of the reviewed studies suggested that the feelings mentioned above were related to other factors that affected physical assessments' performance. One of which was the challenges related to nursing education. These challenges specifically involve theory and clinical instruction, laboratory simulation, and students' previous clinical experience. Moreover, students reported that the clinical environment and night-shift schedule were barriers that led to confusion, exhaustion, and poor performance. Therefore, this review's findings suggest an interrelatedness of the challenges related to nursing education and clinical practice. A collaborative effort must be made to address the issues often faced by nursing students in performing routine physical assessments and to balance the delivery of instruction and policies. This effort would improve the emotional state of nursing students by reducing anxiety. Moreover, to have more constructive competency-based learning the academic and clinical settings should be integrated. Competency-based education can allow students to verbalize their questions and concerns freely and take the necessary actions to improve their competency in performing physical assessments.

Ethical consideration

This integrative review was approved as "exempt" by the institutional review board of Majmaah University. An exemption letter was secured allowing the authors to proceed in the conduct of this study.

Funding

The authors would like to thank Deanship of Scientific Research at Majmaah University, Kingdom of Saudi Arabia (Project number 1440-08) for supporting this work.

CRediT authorship contribution statement

Jestoni D. Maniago: Conceptualization, Methodology, Formal analysis, Writing - original draft. **Evelyn E. Feliciano:** Investigation, Writing - review & editing, Visualization. **Adelina M. Santos:** Investigation, Writing - review & editing, Visualization. **Cyrelle L. Agunod:** Investigation, Writing - review & editing, Visualization. **Cris S. Adolfo:** Supervision, Project administration. **Brian A. Vasquez:** Supervision, Project administration. **Abdulrhman Albougami:** Project administration, Funding acquisition. **Joseph U. Almazan:** Conceptualization, Methodology, Project administration.

Declaration of competing interest

All authors have no conflicts of interest to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijnss.2020.12.013>.

References

- [1] Academy of Medical Surgical Nurses. Patient care. 2018. Retrieved from,

- <https://www.amsn.org/practice-resources/patient-care>. [Accessed 30 November 2019].
- [2] International Council of Nurses. International council of nurses address key issues for nursing at 69th world health assembly 2016. Retrieved from <http://www.cgfn.org/international-council-of-nurses-address-key-issues-for-nursing-at-69th-world-health-assembly/>. [Accessed 20 June 2016].
 - [3] Douglas C, Osborne S, Reid C, Batch M, Hollingdrake O, Gardner G, et al. What factors influence nurses' assessment practices? Development of the Barriers to Nurses' use of Physical Assessment Scale. *J Adv Nurs* 2014;70(11):2683–94. <https://doi.org/10.1111/jan.12408>. Epub 2014/04/07.
 - [4] Fukada M. Nursing competency: definition, structure and development. *Yonago Acta Med* 2018;61(1):1–7. Epub 2018/03/28.
 - [5] Theisen JL, Sandau KE. Competency of new graduate nurses: a review of their weaknesses and strategies for success. *J Cont Educ Nurs* 2013;44(9):406–14. <https://doi.org/10.3928/00220124-20130617-38>. Epub 2013/06/24.
 - [6] World Health Organization. Mental health: a state of well-being. Retrieved from, http://www.who.int/features/factfiles/mental_health/en/; 2014. 9 September 2016.
 - [7] Stanford Health Care. Medical staff: medStaff update. Retrieved from, <https://stanfordhealthcare.org/health-care-professionals/medical-staff/medstaff-update/2016-december.html>; 2016. 4 December 2016.
 - [8] Rafiee G, Moattari M, Nikbakht AN, Kojuri J, Mousavinasab M. Problems and challenges of nursing students' clinical evaluation: a qualitative study. *Iran J Nurs Midwifery Res* 2014;19(1):41–9. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3917184/>.
 - [9] Jamshidi N, Molazem Z, Sharif F, Torabizadeh C, Najafi Kalyani M. The challenges of nursing students in the clinical learning environment: a qualitative study. *Sci World J* 2016;2016:1–7. <https://doi.org/10.1155/2016/1846178>.
 - [10] School Nurse Organization of Minnesota. Health and physical assessments for special education. 2014. Retrieved from <https://www.minnesotaschoolnurses.org/special-education/health-and-physical-assessments-for-special-education>. [Accessed 30 November 2019].
 - [11] Alamri M, Almazan J. Barriers of physical assessment skills among nursing students in Arab Peninsula. *Int J Health Sci* 2018;12(3):1–9. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5969778/>.
 - [12] Anderson B, Nix E, Norman B, McPike HD. An evidence based approach to undergraduate physical assessment practicum course development. *Nurse Educ Pract* 2014;14(3):242–6. <https://doi.org/10.1016/j.nepr.2013.08.007>.
 - [13] Birks M, Cant R, James A, Chung C, Davis J. The use of physical assessment skills by registered nurses in Australia: issues for nursing education. *Collegian* 2013;20(1):27–33. <https://doi.org/10.1016/j.colegn.2012.02.004>.
 - [14] Levett-Jones T, Gersbach J, Arthur C, Roche J. Implementing a clinical competency assessment model that promotes critical reflection and ensures nursing graduates' readiness for professional practice. *Nurse Educ Pract* 2011;11(1):64–9. <https://doi.org/10.1016/j.nepr.2010.07.004>. Epub 2010/08/19.
 - [15] Dela Cruz Q, DiBerardino P, Endrano B, Gonzaga M, Guerrero R. Health assessment in the new curriculum: a descriptive study on student nurses' competence in performing physical examination. *CAM Res J* 2014;2(1):72–95. <http://pulaguna.edu.ph/wp-content/uploads/2016/08/4.-Health-Assessment-in-the-New-Curriculum-A-Descriptive-Study-on-Student-Nurses-Competence-in-Performing-Physical-Examination.pdf>.
 - [16] Douglas C, Windsor C, Lewis P. Too much knowledge for a nurse? Use of physical assessment by final-semester nursing students. *Nurs Health Sci* 2015;17(4):492–9. <https://doi.org/10.1111/nhs.12223>. Epub 2015/07/03.
 - [17] Leh SK. Nursing students' preconceptions of the community health clinical experience: implications for nursing education. *J Nurs Educ* 2011;50(11):620–7. <https://doi.org/10.3928/01484834-20110729-01>. Epub 2011/07/29.
 - [18] Raleigh M, Allan H. A qualitative study of advanced nurse practitioners' use of physical assessment skills in the community: shifting skills across professional boundaries. *J Clin Nurs* 2017;26(13–14):2025–35. <https://doi.org/10.1111/jocn.13613>. Epub 2017/04/19.
 - [19] Whittemore R, Knaf K. The integrative review: updated methodology. *J Adv Nurs* 2005;52(5):546–53. <https://doi.org/10.1111/j.1365-2648.2005.03621.x>.
 - [20] Kmet LM, Lee RC, Cook LS. Standard quality assessment criteria for evaluating primary research papers from a variety of fields. Edmonton: Alberta Heritage Foundation for Medical Research (AHFMR); 2004. AHFMR - HTA Initiative #13, <http://www.ihe.ca/advanced-search/standard-quality-assessment-criteria-for-evaluating-primary-research-papers-from-a-variety-of-fields>.
 - [21] Dearmon V, Graves RJ, Hayden S, Mulekar MS, Lawrence SM, Jones L, et al. Effectiveness of simulation-based orientation of baccalaureate nursing students preparing for their first clinical experience. *J Nurs Educ* 2013;52(1):29–38. <https://doi.org/10.3928/01484834-20121212-02>. Epub 2012/12/12.
 - [22] Palese A, Basso F, Del Negro E, Achil I, Ferraesi A, Morandini M, et al. When are night shifts effective for nursing student clinical learning? Findings from a mixed-method study design. *Nurse Educ Today* 2017;52:15–21. <https://doi.org/10.1016/j.nedt.2017.02.005>. Epub 2017/02/11.
 - [23] Pauly-O'Neill S, Prion S, Nguyen H. Comparison of Quality and Safety Education for Nurses (QSEN)-related student experiences during pediatric clinical and simulation rotations. *J Nurs Educ* 2013;52(9):534–8. <https://doi.org/10.3928/01484834-20130819-02>. Epub 2013/08/19.
 - [24] Sharif F, Masoumi S. A qualitative study of nursing student experiences of clinical practice. *BMC Nurs* 2005;4:6. <https://doi.org/10.1186/1472-6955-4-6>. Epub 2005/11/09.
 - [25] O'Lynn C, Krautscheid L. Evaluating the effects of intimate touch instruction: facilitating professional and respectful touch by male nursing students. *J Nurs Educ* 2014;53(3):126–35. <https://doi.org/10.3928/01484834-20140211-08>.
 - [26] Wu FQ, Wang YL, Wu Y, Guo M. Application of nursing core competency standard education in the training of nursing undergraduates. *Int J Nurs Sci* 2014;1(4):367–70. <https://doi.org/10.1016/j.ijnss.2014.10.010>.
 - [27] Fan JY, Wang YH, Chao LF, Jane SW, Hsu LL. Performance evaluation of nursing students following competency-based education. *Nurse Educ Today* 2015;35(1):97–103. <https://doi.org/10.1016/j.nedt.2014.07.002>. Epub 2014/07/11.
 - [28] Yastik J, Anthony M. Health assessment in a 2-week intensive format for second-degree baccalaureate nursing students. *J Nurs Educ* 2009;48(3):158–60. <https://doi.org/10.3928/01484834-20090301-01>.
 - [29] Edwards D, Burnard P, Bennett K, Hebden U. A longitudinal study of stress and self-esteem in student nurses. *Nurse Educ Today* 2010;30(1):78–84. <https://doi.org/10.1016/j.nedt.2009.06.008>.