(REVIEW ARTICLE)

Impact of learning program on enhancing nursing practice and knowledge in ulcer management: A systematic review

Zahra Jaffer Al-Ghawwas [1, *], Insherah Abdullah Abu dheeb [2], Fatimah rashed alahmari [3], Nada Abdulmohsen Al Faraj [4], Aqilah Mahdi Almohsen [5], Feda mahdi al shaiban [6], Zahraa Abdulkarim Alnass [7], Noorah Salem Almarry [8], Fahima luqman AlDawoud [9], Abrar Habeeb Bokhamseen [10], Maryam Hassan Al Hamada [11], Alaa Abdullah ALMustafa [12], Abeer Ahmed ALMuhana [13] and Fatimah Ali Talaqof [14]

[1] Staff nurse 1 Out Patient department, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.
[2] Staff nurse 1, Nursing Department, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.
[3] Respiratory therapist, Respiratory Departmet, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.
[4] Staff Nurse, patient educator, Labor and delivery, Nursing department, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.
[5] Staff Nurse 1, Pre-Anesthesia clinic, Out-patient department, King Abdulaziz Medical City, NGHA, Jeddah, Saudi Arabia.
[6] Radiographic technologist, Radiology Department, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.
[7] Staff nurse 1, Emergency department, King Abdulaziz Medical City, NGHA, Riyadh, Saudi Arabia.
[8] Respiratory Therapist, Respiratory Care Department, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.
[9] Staff Nurse 1, Nursery, Nursing Department, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.
10 Respiratory Therapist, Respiratory Care Department, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.
11 Staff Nurse, Pediatric, Nursing Department, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.
12 Staff nurse, Nursing Department, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.
13 Respiratory Therapist (PFT), Respiratory Care Department, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.
14 Registered nurse, Nursing Department, Imam Abdulrahman bin faisal Hospital, NGHA, Dammam, Saudi Arabia.

Abstract

Background: Nurses who care for patients with pressure injuries often have to work longer shifts and may feel guilty or mentally distressed due to the development of the injury or the patients' delayed recovery. The purpose of this study is to evaluate how effectively nurses' knowledge and practices when providing care for patients with pressure injuries are supported by e-learning programs.

Method: Our research was carried out in compliance with PRISMA criteria. To finish the systematic literature review, the databases MEDLINE, EMBASE, SCOPUS, and Cochrane were searched. We searched for "learning," "pressure ulcer," "pressure," "ulcer," "pressure ulcer," and "pressure injuries." Databases spanning 2010 to 2020 were included in the search period, and only English-language research was taken into account.

Results: Six papers total—two non-randomized trials and four randomized control trials—were included in this systematic review. Nurses from intensive care units were involved in the majority of the included research. The NPUAP, PUKT, PU evaluation, PU evaluation, and EPUAP scales were used. The interventions used included bedsore treatment

* Corresponding author: Zahra Jaffer Al-Ghawwas

and prevention, pressure ulcer screening and treatment programs, and a program for training on the Braden scale and PU classification. The knowledge and practice were outcome measures.

Conclusion: Our comprehensive study highlights the potential of e-learning programs to significantly enhance the knowledge and practice of nursing professionals in managing pressure injuries.

Keywords: Nurse; Learning; Injury; Ulcer; Knowledge; Practice

1. Introduction

Patients who sustain pressure ulcer (PU) suffer adverse effects, as do nurses and other healthcare personnel who treat them (1). Because of the development of the PU or the patients' delayed recovery, nurses who care for patients with PU must work longer shifts and may experience guilt and mental anguish (2). Hospital administration, which is in charge of paying out reimbursements or compensation, has also come to see PU as a major problem (3). In addition to these problems, one of the most significant markers of a healthcare facility's quality is PU. Early diagnosis lowers the number of needless hospital stays and promotes a quicker rate of recovery (4).

PU prevention, early identification, and appropriate management are vital for patients, nurses, and healthcare institutions. Nursing staff members must so acquire the necessary skills to care for patients who suffer PU. However, prior research revealed that nursing staff generally possesses a poor level of competence (5), and they frequently lack the knowledge and resources required to care a patient who has suffered a PU. In order for nurses to provide successful treatment for patients with PU, it is imperative that they have a thorough understanding of the many stages of PU and that they get assistance in developing their clinical judgment, decision-making, and categorization abilities (6).

It is critical that nurses improve their knowledge and skill sets, and offering extensive educational programs can encourage a proactive approach to nursing practices, particularly with regard to PU care. Historically, in-person lectures, facility-based training, or the direct incorporation of these elements into the nursing curriculum have been the main modes of delivering this kind of education (7–9). Though useful, these methods have encountered several difficulties because of the outbreak, highlighting the need for more adaptable, digitalized teaching strategies. This study aims to determine how well e-learning programs support nurses' knowledge and behaviors when caring for patients with PU.

2. Method

Our study was conducted according to PRISMA guidelines. Our search targeted studies done on nurses who care for patients with PU, nurses who work in intensive care units or surgery units, nurses who provide home care for patients with chronic illnesses, and undergraduate nursing students who are completing training. Included were studies comparing the effectiveness of online learning programs for managing PU to conventional on-campus or in-person lectures or no training at all. Included were studies that described the knowledge or practice strategies used by nurses to avoid or manage PU.

The following databases were searched in order to complete the systematic literature review: MEDLINE, EMBASE, SCOPUS, and Cochrane. Learning, PU, pressure, ulce, PU, and PU were the search phrases we used. The search period covered databases from 2010 to 2020, and only English-language research was considered. Following the identification of the final eligible full-text articles, four of the authors used a pre-defined data collecting form to manually extract data.

3. Result

In this systematic review we included 6 studies, 4 randomized control trials and two non-randomized trials. In most of the included studies intensive care unit nurses were included. Scales utilized were; NPUAP, PUKT, PU evaluation, PU evaluation and EPUAP. Intervention utilized were; Program for training on the Braden scale and PU categorization, bedsores treatment and prevention, and PU assessment and treatment programs. Outcome measures were practice and knowledge.

In contrast to a conventional on-campus lecture technique, the study by Morente et al. demonstrates the efficacy of an e-learning approach based on the usage of a Web-based adaptive tool designed for teaching on PU assessment. Significant disparities between the two groups of randomly selected undergraduate nursing students with similar beginning circumstances were discovered following the completion of a single instructional session. Students who used

the e-learning technique were generally more adept at evaluating PU than students who attended traditional lecture-style classes.

Bredesen et al. state that maintaining and improving a nurse's competency in PU risk assessment and categorization requires ongoing education. Because traditional classroom courses need more organization, an instructor, and a lecture venue, the heavy burden on wards may make attendance difficult. When comparing e-learning software to lectures in a classroom, Bredesen et al. reported comparable or superior outcomes. Given that nurses may complete the curriculum at their own convenience, an e-learning program might be a more effective approach. They can also retake the course and the exam as many times as necessary to get a competent level.

Nurses in the experimental group in the Tubaishat et al. (2014) study got an e-learning instructional package on PU categorization, whereas nurses in the control group watched a lecture about the subject. Before the training, both groups were asked to complete a pre-test, and following the training, they performed a post-test with the same questions. The pre-test stage revealed that the nurses' PU categorization abilities were inadequate. These weak abilities were improved by both forms of instruction, but e-learning was shown to be more successful since the experimental group's outcomes were statistically significant when compared to the control group's. The ability of Jordanian nurses to classify PUs was deficient. When it came to enhancing students' PU categorization abilities, the usage of an e-learning application proved to be more successful than traditional classroom instruction.
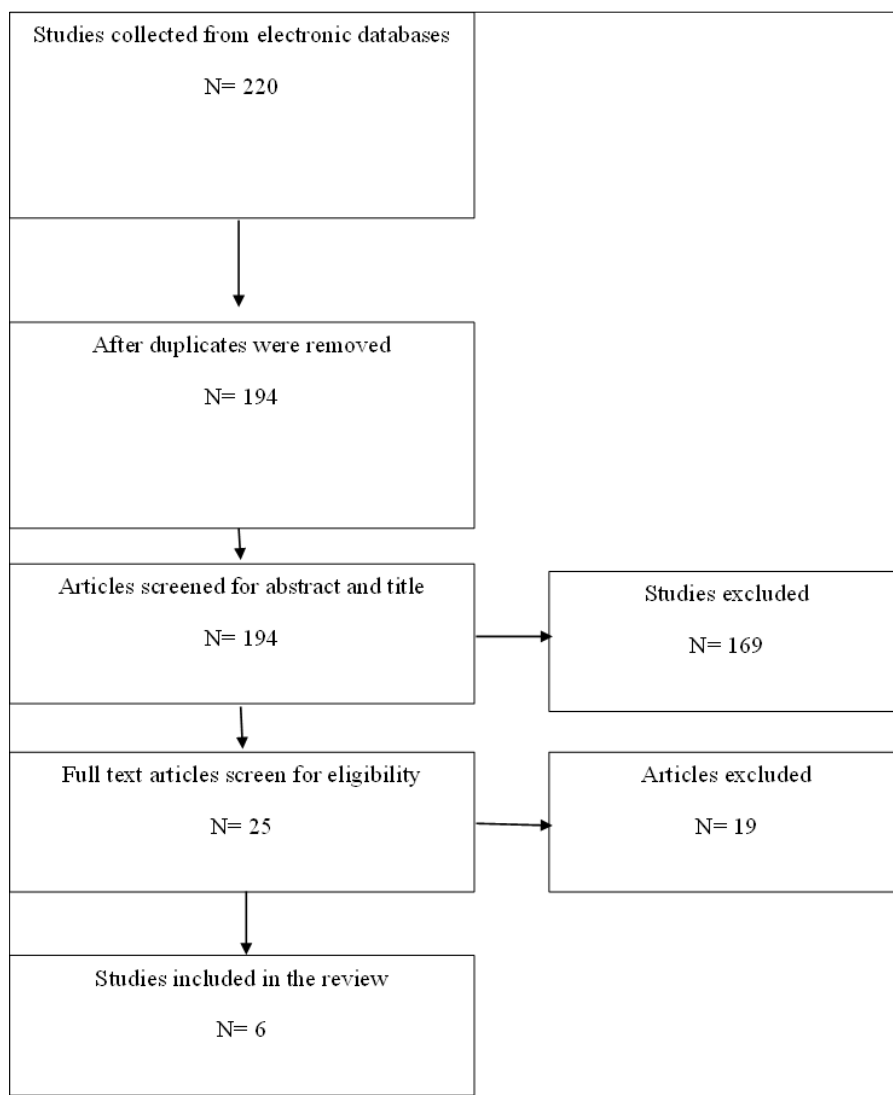

Figure 1 PRISMA consort chart of study selection

Table 1 Characteristics of the included studies

Citation	Design	Participants	Intervention	Scale	Outcome
Bredesen et al. (10)	RCT	Nurses who provide acute care nursing homes or hospital wards	Program for training on the Braden scale and PU categorization	National Pressure Ulcer Advisory Panel; NR, not reported (NPUAP)	Practice measures
Cox et al. (11)	RCT	Intensive Care Unit nurses	Bedsores treatment and prevention	Pressure Ulcer Knowledge test (PUKT)	Knowledge
Karimian et al. (12)	RCT	ICU Nurses	Bedsores treatment and prevention	PUKT	Knowledge
Morente et al. (13)	RCT	Students pursuing undergraduate degrees in nursing	PU assessment and treatment	Pressure Ulcer evaluation	Knowledge and practice
Okhovati et al. (14)	Non-randomized trial	ICU nurses	PU assessment and treatment	Diagnostic Ability Score	Practice measures
Tubaishat (15)	Non-randomized trial	Nurses	PU assessment and treatment	European Pressure Ulcer Advisory Panel (EPUAP)	Practice measures

Table 2 Main findings of the included studies

Citation	Main findings
Bredesen et al. (10)	Braden subscale scores were not raised by an online course. However, in the post-test conducted just after training, the intervention group considerably outperformed the control group in several areas related to PU categorization. Nevertheless, there were no appreciable variations in the groups' categorization abilities after three months.
Cox et al. (11)	Based on an analysis of variance, there were significant differences between the three groups' pretest, posttest, and posttest to 3-month scores. Regardless of the mode of instruction, the most substantial loss of information regarding PUs happened over the first three months. These results suggest that quarterly education on PU avoidance is a good way to keep up knowledge. One effective way to learn and remember PU avoidance is through computer-based education.
Karimian et al. (12)	The experimental group's PUKT questionnaire score increased from 15.68 to 29.75, whereas the control group's pre-intervention scores were 16.40 and 17.54, respectively. This difference was not significant statistically. Additionally, there was no statistically significant difference in the APUP questionnaire scores before and after the intervention between the experimental group (27.12 to 39.37) and the control group (27.65 to 28.37).
Morente et al. (13)	The outcomes demonstrate the increased efficacy of the developed e-learning strategy for PU management education.
Okhovati et al. (14)	The mean scores of the nurses in the intervention group were considerably higher than the mean scores of the nurses in the control group after the empowerment program. According to this study, putting in place an empowerment program can improve nurses' capacity to identify PUs and correctly assess their stage. Key words: staging, visual differential diagnosis, empowerment, and PU.
Tubaishat (15)	While experimental group nurses participated in an online instruction session on PU categorization, control group individuals attended a conventional lecture on the subject. Before the training, both groups were asked to complete a pre-test, and following the training, they performed a post-test with the same questions. Results: During the pre-test phase, the nurses' abilities to classify PUs were inadequate. These weak abilities were improved by both forms of instruction, but e-learning was shown to be more successful since the experimental group's outcomes were statistically significant when compared to the control group's.

4. Discussion

When it comes to treating patients with PU, nurses are essential. The aim of this study was to evaluate how well e-learning programs have improved the skills and knowledge of nursing personnel in the management of patients who have PU. Six research projects in all were examined, the majority of which were conducted in Europe. This is unexpected considering the growing dependence on online learning environments and the possibility that e-learning might help healthcare educators overcome the obstacles.

It has been observed that e-learning programs for nurses have the potential to greatly enhance their expertise and methods for the care of PU. Although there haven't been any reviews that concentrate exclusively on e-learning programs, prior studies evaluating the effects of educational programs have stated that e-learning programs are superior to face-to-face programs in terms of developing nurses' knowledge and practices (16). We also discovered that the majority of trials simply ran the program for few hours. This demonstrates that e-learning initiatives are highly practicable and can be included into hospital nurses' orientation and refresher training courses.

According to the studies included in the review, e-learning programs have several other benefits, including lower program costs, a wider reach, and the capacity to train a large number of nurses in a single program (10–12,14). It is imperative to first standardize the material before implementing e-learning programs everywhere. In order to complete the material and provide the virtual training program in a more efficient way, a concerted effort should be undertaken. Standardizing the instrument for evaluating nurses' PU knowledge is also necessary, in addition to the intervention package. Additionally, a scale to gauge one's degree of knowledge of PU has been established and confirmed in a recent study (17). This scale can be used as a standard method of evaluation in future studies.

In the research of Bredesen et al. For each of the three exams, there were no discernible variations in the Braden subscale scores between the classroom and e-learning program groups. In the post-test conducted right after training, the e-learning program group outperformed the classroom group in several areas for the PU categorization program.

The goal of Karimian et al.'s 2020 study was to ascertain how training interventions affected nurses' attitudes and knowledge about PU prevention. ICU ward nurses were randomized at random to either the intervension or control group for Karimian et al.'s 2020. The nurses in the intervention group were divided into groups of four to five people, and each group participated in virtual training sessions using instructional films on bed sores in addition to four in-person training sessions. The 2020 study by Karimian et al. found that nurses' attitudes and knowledge about PU prevention were enhanced by educational intervention.

Okhovati et al. sought to investigate the impact of an empowerment program for ICU nurses on their capacity for differential diagnosis of PU staging. The results demonstrated that the introduction of an empowerment program resulted in the development of differential diagnosis of various PU stages, except for the third-stage ulcer. The results also revealed that there was no statistically significant difference in the nurses' ability to distinguish between a first-stage PU prior to and following the intervention in the intervention group. Nevertheless, nurses were able to identify the first-stage PU following the intervention and received a higher score, with a larger percentage obtaining the full score.

Following the intervention, the percentage of nurses who scored higher in the differential diagnosis of first-stage PUs was similarly higher in the study conducted by Lee and Kim (18).The study's findings also shown that nurses in the control group were able to correctly diagnose the PU in its initial stage with a goodscore. As a consequence, the conclusions of the research by Lee and Kim (18) agree with the outcomes of this investigation. But in the study by Ham et al., the majority of participants had unintentionally chosen the first-stage PU with nonblanchable erythema or healthy skin.The nurses were less perplexed because these two factors had not been utilized in this investigation (19).

5. Conclusion

The potential of e-learning programs to dramatically improve nursing staff's knowledge and practice in managing PU is highlighted by our systematic evaluation. Although there are many different e-learning programs available, our research highlights the need to standardize these treatments in terms of both content and measuring techniques before clearly establishing their efficacy.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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