



Research Article

Evaluating the Impact of a Healthcare Quality Course on Nursing Students' Knowledge: A Pre-Post Intervention Study from Jordan

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Abstract

Background: The evolving demands of modern healthcare necessitate that nursing education extend beyond clinical skills to include systems-based practices such as healthcare quality improvement, accreditation, and patient safety. While healthcare quality courses are increasingly integrated into nursing curricula globally, their effectiveness in improving student knowledge—particularly in low- and middle-income settings like Jordan—remains understudied. **Objectives:** To assess improvements in knowledge of healthcare quality, accreditation, and patient safety among nursing students at Jerash University, Jordan, following a 14-week course. **Methods:** A one-group pretest-posttest design was employed. After obtaining the ethical permission, a 30-item multiple-choice exam (10 items per domain: healthcare quality improvement, accreditation, and patient safety) and 10 demographic items were administered online via Google Forms as a pretest (5–12 March 2023) and post-test (22–29 June 2023) to 53 nursing Bachelor students enrolled in an elective course, primarily targeting final-year students but open to students from other years. **Results:** Paired t-tests revealed significant improvements in mean scores from pretest to post-test across all domains: healthcare quality (4.08-6.67, $p<0.001$), accreditation (3.36-6.26, $p<0.001$), and patient safety (3.67 to 6.83, $p<0.001$). **Conclusions:** The course's effectiveness in enhancing students' knowledge offers evidence-based insights for curriculum development and ensuring nursing graduates are well-prepared for contemporary healthcare challenges.

Keywords: Accreditation, Medical education, Nursing, Patient safety, Quality improvement.

تقييم تأثير مساق جودة الرعاية الصحية على معرفة طلاب التمريض: دراسة ما قبل وبعد التدخل من الأردن

الخلاصة

الخلفية: تتطلب متطلبات الرعاية الصحية الحديثة المتطورة أن يمتد التعليم التمريضي إلى ما هو أبعد من المهارات السريرية ليشمل الممارسات القائمة على الأنظمة مثل تحسين جودة الرعاية الصحية، والاعتماد، وسلامة المرضى. بينما يتم دمج مساقات جودة الرعاية الصحية بشكل متزايد في مناهج التمريض على مستوى العالم، لا تزال فعاليتها في تحسين معرفة الطلاب - خصوصاً في البيئات ذات الدخل المنخفض والمتوسط مثل الأردن - غير مدروسة بشكل كافٍ. **الأهداف:** تقييم التحسينات في المعرفة بجودة الرعاية الصحية، والاعتماد، وسلامة المرضى بين طلاب التمريض في جامعة جرش، الأردن، بعد مساق استمر 14 أسبوعاً. **الطرائق:** تم استخدام تصميم الاختبار القبلي والاختبار البعدي لمجموعة واحدة. وبعد الحصول على الإذن الأخلاقي، تم إجراء اختبار اختيار متعدد مكون من 30 سؤالاً (10 أسئلة لكل مجال: تحسين جودة الرعاية الصحية، الاعتماد، وسلامة المرضى) و10 أسئلة ديموغرافية عبر الإنترنت بنماذج Google Forms كاختبار قبلي (5-12 مارس 2023) وبعد الاختبار (22-29 يونيو 2023) لـ 53 طالب بكالوريوس تمريض مسجلين في مساق اختياري، تستهدف بشكل أساسي طلاب السنة النهائية ولكن مفتوحة للطلاب من سنوات أخرى. **النتائج:** أظهرت اختبارات T المزدوجة تحسناً كبيراً في متوسط الدرجات من ما قبل الاختبار إلى ما بعد الاختبار عبر جميع المجالات: جودة الرعاية الصحية (4.08-6.67، $p<0.001$)، الاعتماد (3.36-6.26، $p<0.001$)، وسلامة المرضى (3.67 إلى 6.83، $p<0.001$). **الاستنتاجات:** توفر فعالية المساق في تعزيز معرفة الطلاب رؤى مبنية على الأدلة لتطوير المناهج وضمان استعداد خريجي التمريض جيداً لتحديات الرعاية الصحية المعاصرة.

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INTRODUCTION

The developing nature of healthcare systems mandates that nursing education include systems-based practices, such as healthcare quality improvement, accreditation standards, and patient safety protocols [1,2]. While core nursing courses such as adult, maternal, and pediatric nursing form the backbone of nursing education, other specialized courses like healthcare quality improvement are now essential for preparing nursing graduates to meet the requirements of developing healthcare systems [3]. In order to improve patient outcomes, the Institute of Medicine (IOM) has emphasized the necessity for

healthcare professionals to acquire competencies in healthcare quality improvement [4]. Similarly, the World Health Organization's (WHO) patient safety curriculum emphasizes the value of educating nursing students about sentinel events, near misses, and the International Patient Safety Goals (IPSGs) to promote a culture of patient safety and ongoing healthcare quality improvement [2]. An initiative that has gained international recognition for preparing nurses to deliver safe, effective, and patient-centered care is the Quality and Safety Education for Nurses (QSEN) competency program [5,6]. According to recent studies, junior nurses' knowledge, skills, and

attitudes can be improved through QSEN-based education [7]. In recent decades, hospital accreditation by institutions such as the Joint Commission International (JCI) has been widely adopted [8]. As a result, nursing professionals are progressively required to demonstrate competency in healthcare quality improvement, accreditation standards, and patient safety protocols [9]. This change has highlighted a critical need to equip nursing graduates with the knowledge required to contribute to hospital accreditation [1,9,10]. This need is particularly great in low- and middle-income countries (LMICs), such as Jordan, where national efforts to improve healthcare standards have led to a strong focus on healthcare quality, accreditation, and patient safety [7,11]. The Jordanian government, in collaboration with the WHO and the Health Care Accreditation Council (HCAC), has invested in modernizing its healthcare system and complying with international standards [8]. For instance, the Jordan National Quality and Patient Safety Policy & Strategy (JNQPS) outlined a vision for excellence in healthcare services through accountability, standardization, and workforce training [11]. Furthermore, the establishment of the HCAC in 2007 as an independent national accrediting organization has solidified Jordan's commitment to promoting a culture of continuous healthcare improvement and patient safety across public and private health sectors [11,12]. Similarly, in Palestine, initiatives like the QSEN program have been implemented to enhance nursing competency in quality and safety [7]. Although several nursing schools in Jordan have already integrated elective courses on healthcare quality, accreditation, and patient

safety into their curricula, the effectiveness of these educational interventions remains unexamined [13]. Studies in high-income countries have demonstrated the positive impact of structured educational courses on nursing students' knowledge and competency in healthcare quality and patient safety [1,3]. However, similar research in LMICs with restricted resources is limited. This study aims to address this gap by evaluating the effectiveness of an elective 14-week course on healthcare quality improvement, accreditation standards, and patient safety protocols among Bachelor of Nursing students at Jerash University, Jordan. The findings will provide insights for nursing schools and policymakers, informing curriculum development to ensure that nursing graduates have the necessary knowledge about healthcare quality improvement, accreditation standards, and patient safety protocols required for contemporary healthcare practice.

METHODS

Study design and setting

This one-group pretest-posttest study evaluated the effectiveness of a 14-week course on healthcare quality improvement, accreditation standards, and patient safety protocols among 53 Bachelor of Nursing students at Jerash University, Jordan. The course was delivered during the first semester of the 2023/2024 academic year. All students enrolled in the course were invited to participate, and those who provided informed consent were included in the study (Figure 1).

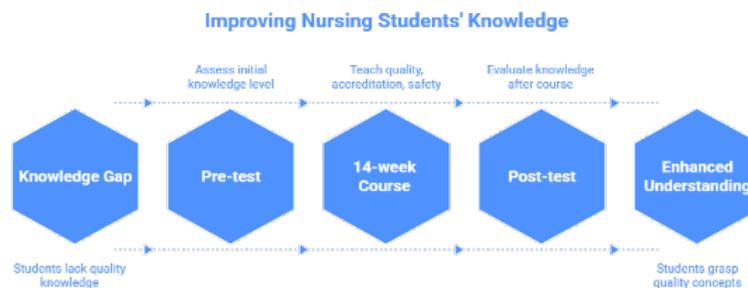


Figure 1: Flowchart of the study.

Course description

The course was an elective course, taught over a 14-week period, and titled "Principles of Quality and Patient Safety" (Course Code: 0801340). The course was taught in English during the first semester of the 2023/2024 academic year. The course aimed to equip nursing students with the knowledge necessary for contemporary healthcare practice and settings. It covered three core areas: healthcare quality improvement, accreditation standards, and patient safety protocols. Specifically,

students learned about the six domains of healthcare quality, various quality improvement tools (such as run and Pareto charts), and models like FOCUS-PDSA. The course also provided a comprehensive overview of accreditation standards from international and local agencies, including the survey processes. Finally, the course provided students with essential patient safety concepts, including sentinel events, near misses, and the IPGs. The course utilized a blended delivery method

with interactive lectures, open discussions, and case scenarios.

Instrument and data collection

Data were collected using an online 40-item instrument administered via Google Forms. In addition to 10 demographic items (e.g., gender, academic program, prior healthcare experience), the instrument comprised a 30-item multiple-choice exam (10 items per domain: healthcare quality improvement, accreditation standards, and patient safety protocols) to assess students' knowledge. The multiple-choice exam was developed based on the course learning objectives, which were aligned with established frameworks such as QSEN competencies. A panel of nursing education experts at Jerash University, Jordan reviewed the exam items to make sure they accurately reflected the domains of healthcare quality improvement, accreditation standards, and patient safety protocols. The exam was informally pre-tested with a small group of faculty and students to assess clarity and relevance. The exam was administered as a pretest (5–12 March 2023) and post-test (22–29 June 2023). A panel of nursing education experts reviewed the multiple-choice items for content validity after the course instructors developed them based on the course learning objectives. Participants received a link to the Google Form via email and were instructed to complete it within a specified timeframe. Only students who answered both tests were included in the data analysis.

Ethical considerations

Ethical approval for this study was obtained from the Institutional Review Board (IRB) of Yarmouk University (Approval No. 2/4/2022/2023). All participants provided electronic informed consent through Google Forms before accessing the exam. Participants received guarantees of anonymity and confidentiality, and their choice to participate or not had no bearing on their academic performance. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist was followed in reporting this study [14] (Supplementary File).

Data analysis

Data were analyzed using descriptive and inferential statistics. Paired t-tests were used to compare pretest and post-test scores, assessing the statistical significance of changes in knowledge. A p -value of <0.05 was considered statistically significant.

RESULTS

A total of 53 nursing students participated in the study (Table 1). The majority of participants were female (69.8%), and most were single (81.1%). A significant proportion of the participants came from families with 5–9 members (73.6%), reflecting a typical family structure in Jordan.

Table 1: Characteristics of the study participants

Characteristic	Category	Frequency (%)
Gender	Female	37(69.8)
	Male	16(30.2)
Marital Status	Single	43(81.1)
	Married	10(18.9)
Family Size	< 5 family members	12(22.6)
	5-9 family members	39(73.6)
	≥10 family members	2(3.8)
Monthly Family Income	<500 JD's	29(54.7)
	500-999 JD's	21(39.6)
	1000-1499 JD's	2(3.8)
	≥1500 JD's	1(1.9)
Province	North	37(69.8)
	Middle	15(28.3)
	South	1(1.9)
Living Place	With family	53(100)
	Regular program	29(54.7)
Study Program	Bridging program	24(45.3)
	Study Year	First year
Second year		22(41.5)
Third year		5(9.4)
Fourth year		24(45.3)
Previous Health Work	Didn't work in healthcare	38(71.7)
	Worked for 1 year	6(11.3)
	Worked for 2 years	2(3.8)
	Worked for 3 years or more	7(13.2)
GPA	<61%	7(13.2)
	61-70.9%	28(52.8)
	71-80.9%	16(30.2)
	81-90.9%	2(3.8)

In terms of socioeconomic status, over half of the participants reported a monthly family income of less than 500 JDs (54.7%), indicating a predominantly lower-to-middle-income background. Geographically, most participants were from the Northern region of Jordan (69.8%), with a smaller proportion from the Middle (28.3%) and only a minimal representation from the Southern region (1.9%). Academically, participants were nearly evenly distributed between the regular program (54.7%) and the bridging program (45.3%). The largest groups were second-year (41.5%) and fourth-year students (45.3%), suggesting a balanced representation of both early and advanced nursing students. Notably, the majority of participants (71.7%) had no prior experience working in healthcare, which highlights the importance of educational interventions like this course in preparing future nursing professionals. Academic performance, as measured by GPA, showed that over half of the participants (52.8%) had a GPA between 61 and 70.9%, indicating a moderate level of academic achievement. The paired samples statistics reveal a notable improvement in mean scores from pretest to post-test in all domains (Table 2). For healthcare quality, the mean

score increased from 4.08 ± 1.84 in the pretest to 6.67 ± 2.67 in the post-test. Similarly, the accreditation domain increased from 3.36 ± 1.96 to 6.26 ± 2.99 , and the patient safety domain improved from 3.67 ± 1.64 to 6.83 ± 2.40 . These improvements indicate that the intervention had a positive impact on participants' knowledge in all three areas. The paired samples correlations indicate a positive correlation between pretest and post-test scores for the three domains: healthcare quality improvement ($r = 0.170$), accreditation standards ($r = 0.233$), and patient safety protocols ($r = 0.285$). The correlation between pretest and post-test scores for patient safety was statistically significant ($p = 0.038$). Furthermore, the paired samples t-test results confirmed the effectiveness of the course. The mean differences between pretest and post-test scores were statistically significant for all domains: -2.61 ($t = -6.382$, $p < 0.001$) for healthcare quality improvement, -2.91 ($t = -6.673$, $p < 0.001$) for accreditation standards, and -3.16 ($t = -9.236$, $p < 0.001$) for patient safety protocols. The 95% confidence intervals for the differences in means did not include zero, reinforcing the significance of these improvements.

Table 2: Paired Samples Statistics, Correlations, and t-test Results

Domain	Pre-test	Post-test	Correlation (r)	(95% CI)	p-value
Healthcare Quality	4.08±1.84	6.67±2.67	0.17	-2.61 (-3.42 to -1.79)	<0.001
Accreditation	3.36±1.96	6.26±2.99	0.233	-2.91 (-3.78 to -2.03)	<0.001
Patient Safety	3.67±1.64	6.83±2.4	0.285	-3.16 (-3.84 to -2.47)	<0.001

Values were expressed as mean±SD. r: Pearson correlation coefficient; 95% CI: 95% Confidence interval of the mean difference.

DISCUSSION

This study aimed to assess improvements in nursing students' knowledge of healthcare quality improvement, accreditation standards, and patient safety protocols following a 14-week course at Jerash University, Jordan. Post-test results showed statistically significant improvements in the mean scores of the three domains assessed: healthcare quality improvement (4.08 to 6.67), accreditation standards (3.36 to 6.26), and patient safety protocols (3.67 to 6.83). Our findings support previous studies highlighting the effectiveness of structured educational interventions in improving nursing students' knowledge of healthcare quality. For instance, a study by Gonzalo and colleagues claimed that integrating systems-based practice competencies into nursing education is vital to meet the demands of contemporary healthcare institutions [1]. Likewise, Canever and colleagues found that nursing graduates who received training in quality improvement were more prepared to contribute to healthcare systems after being hired [3]. Our findings support these studies, indicating that a structured course on healthcare quality improvement can significantly improve students' knowledge of main concepts, including quality domains and tools. A recent study by AlRatrou and colleagues further supports the effectiveness of

competency-based educational programs in improving nursing knowledge, skills, and attitudes [7]. Their quasi-experimental study in Palestine found that a QSEN educational program led to substantial improvements in knowledge (77.02 vs. 49.19, $p < 0.001$), skills (70.16 vs. 44.61, $p < 0.001$), and attitudes (75.47 vs. 46.16, $p < 0.001$) among junior nurses. While our study focused on knowledge improvement among nursing students, the magnitude of improvement in our results (e.g., healthcare quality: 4.08 to 6.67, $p < 0.001$) is comparable, suggesting that structured educational interventions can effectively enhance nursing competency in diverse contexts, including LMICs like Jordan and Palestine. However, unlike studies conducted in high-income countries (e.g., the U.S. and Europe), where validated instruments and longitudinal assessments are commonly used [9], our study relied on a non-validated multiple-choice exam administered via Google Forms. While this approach allows efficient data collection, it may limit the generalizability of our findings. Future research in LMICs should prioritize the development and use of validated assessment tools to strengthen the reliability of results [13]. The significant improvement in students' knowledge of accreditation standards (from 3.36 to 6.26) aligns with global trends emphasizing the importance of accreditation in nursing education. For example,

Mansour *et al.* (2020) noted that hospital accreditation programs, such as those led by the JCI, have become a benchmark for healthcare quality worldwide. In Jordan, the HCAC plays a similar role, and our findings suggest that educational interventions can effectively prepare nursing students to engage with accreditation processes. A study by El-Jardali and Fadlallah on healthcare quality initiatives in Lebanon and Jordan found that workforce training is a critical component of successful accreditation programs [11]. Our results support this, demonstrating that structured courses can bridge gaps in nursing students' understanding of accreditation standards. However, unlike studies that assess the impact of accreditation on hospital performance [9], our study focused solely on knowledge improvement, leaving the application of this knowledge in clinical settings unexplored. Future research should examine how such educational interventions translate into improved accreditation compliance in healthcare facilities. Our findings on patient safety (mean score improvement from 3.67 to 6.83) are consistent with global literature emphasizing the importance of patient safety education in nursing curricula. The WHO Patient Safety Curriculum Guide and IOM competencies both stress the need for nursing students to be trained about sentinel events, near misses, and IPGs [2,4]. Our study reinforces these recommendations, showing that structured education can significantly enhance students' understanding of patient safety principles. A study by Püschel and colleagues found that nursing graduates who received training in patient safety were more confident in identifying and reporting adverse events [13]. Similarly, our results suggest that educational interventions can improve both knowledge and perceptions of patient safety. However, unlike studies that assess long-term retention of knowledge or behavioral changes in clinical practice [10], our study only measured immediate post-intervention knowledge. Future research should explore whether these knowledge gains persist over time and translate into improved patient outcomes. While our study did not employ a flipped classroom approach, the significant improvements in knowledge observed across all domains (healthcare quality improvement, accreditation standards, and patient safety protocols) are consistent with the positive outcomes reported by Kim and colleagues [15]. This alignment suggests that structured educational interventions, regardless of the teaching method, can effectively enhance nursing students' knowledge of critical healthcare concepts, such as quality improvement, accreditation standards, and patient safety protocols.

Implications

Our findings support the integration of structured courses on healthcare quality improvement, accreditation standards, and patient safety protocols into nursing curricula, particularly in LMICs. Given the significant knowledge improvements observed, nursing schools in

Jordan and similar contexts should consider mandating such courses as part of core nursing education and aligning course content with national and international accreditation standards (e.g., JCI, HCAC). Higher education policymakers, in collaboration with the HCAC and Ministry of Health, should collaborate and invest in faculty development to ensure that educators are equipped to teach these critical topics effectively.

Study limitations

The interpretation of the study results may be impacted by some limitations. For instance, using a one-group pretest-posttest design may limit the ability to establish causality or exclude external influences. Also, depending on a multiple-choice exam instead of a validated instrument is another limitation. Furthermore, depending on self-reported data may lead to response bias, because participating students may have felt required to provide desirable answers. Lastly, the sample was relatively small and drawn from a single university, which may limit the generalizability of our findings to other nursing programs in Jordan. To address these limitations, future studies should adopt more rigorous designs, such as quasi-experimental or randomized controlled trials, which include control or comparison groups. Moreover, future studies are recommended to use a validated instrument to enhance the reliability and validity of findings. Finally, future studies should include larger and more diverse samples from multiple institutions to enhance external validity.

Conclusion

This study establishes evidence that a structured specialized course would significantly improve nursing students' knowledge in healthcare quality improvement, accreditation standards, and patient safety protocols. Based on this study's findings, integration of such courses into nursing curricula is necessary to prepare graduates for contemporary healthcare challenges, such as healthcare accreditation standards and patient safety protocols. The actual long-term impact of such courses on clinical practice and patient outcomes should be assessed in future studies.

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Conflict of interests

The author declares no conflict of interest.

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Data sharing statement

Supplementary data can be shared with the corresponding author upon reasonable request.

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