

Perception of Patient Safety, Quality Improvement and Nursing Errors Issues among Undergraduate Nursing Students in Faculty of Nursing, Alexandria University, Egypt

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Abstract: Approximately 50,000-100,000 patients die from medical and nursing errors annually in the USA [1-4]. Incidents are under reported and it is hard to know the exact prevalence of death and adverse events from medical and nurses' errors. Purpose: This study is intended to describe the perception of undergraduate nursing students regarding the patient safety, quality improvement and nursing errors issues before entering the clinical practice. The research question was what are the perception of patient safety, quality improvement and nursing errors issues among undergraduate nursing students. Methods: A descriptive design was utilized in this study. A convenience sample of 100 adult male and female nursing students was chosen from first year students in the faculty of nursing in Faculty of nursing, Alexandria University, Egypt. Data was collected through one tool: used for data collection consisted of three parts. Results: The results revealed that in relation students' sex, the highest percentage was female 62.0 %, all students were first year in the faculty of nursing. Regarding nursing students' previous knowledge about patient safety, 21.0% of nursing students have no knowledge while 40.0% of them have knowledge from the internet and lectures in the college (14.0%). In relation to nursing students' previous knowledge about nursing errors, 30.0% of them have no knowledge while 32.0% have knowledge from the internet. On the other hand, 5.0% have knowledge from informal lectures. Regarding the level of awareness of patient safety and nursing errors, the nursing students rate their knowledge as 41% of them agreed regarding different types of nursing error while 8% strongly disagreed as well as disagree. Furthermore, 47% of nursing students agreed that factors were contributing to nursing error while 7% strongly disagreed. As regard factors influencing patient safety, 40% agreed while 3% strongly disagreed. In addition, 38% of them agreed on the ways of speaking up about the error, but only 2% strongly disagreed. On the other hand, 32% disagreed how to report a nursing error while 29% were neutral the role of health care institutions in error reporting. Firstly, regarding patient safety and nursing errors, 45.0 % of nursing students agreed that most health care practitioners make errors while 6.0% strongly disagreed. 38.0% of them agreed that nursing errors are very common while 7.0% were strongly disagreed. On the other hand, 30.0% of nursing students disagreed that blame someone rather than focus on the causes of error is easy while 4.0% strongly agree. 42.0% of nursing students agreed that it is unusual for patients to be given the wrong drug while 12.0% were strongly disagreed. In addition, 48.0% of nursing students agreed that telling others about an error is easy while 4.0% were strongly disagreed. Regarding nursing students' perceptions about filling in reporting forms will help to improve patient safety, 48.0% and 64.0% were strongly agreed that learning from mistakes could prevent incidents. In addition, 41.0% agreed that concentrating on the causes of incidents could contribute to patient safety. As well as 40.0% agreed that learning how to recognize and deal with errors before the clinical clerkship is important and 38.0 % strongly agreed on the importance of learning how to recognize and deal with errors before the graduation from the nursing school. Secondly, in relation to the quality improvement, 29.0% of nursing students were neutral regarding the meaning of quality improvement in health care, and 36.0 % were neutral about the awareness of what are the clinical quality indicators. In addition, 37.0% strongly agreed the importance of quality improvement for their future as a nurse while 3.0% strongly disagreed 48.0% of nursing students agreed that quality improvement efforts could increase the quality and effectiveness of care while 13.0% were neutral. In addition, 43.0% agreed that is learning about quality by the end of nursing school is important. The majority of nursing students (95%) were preferred the formal course about the patient safety, nursing errors and quality improvement. As regard, nursing students thinking about the formal method for teaching courses for patient safety, nursing errors and quality improvement, 98.95 % of students were rate the lecture method as very helpful for patient safety and nursing errors while 92.64 % reported that lecturer is very helpful for quality improvement. The seminars method was rated as very helpful for patient safety, nursing errors and quality improvement (89.48 % and 83.16 %) respectively. In conclusion, quality and safety education for nurses (QSEN) addresses the challenge of preparing nurses with the competencies necessary to continuously improve the quality and safety of the health care systems in which they work for pre-licensure education are appropriate goals for students preparing for basic practice as a registered nurse. Undergraduates nurses should be educated to deliver patient centered care as members of an interdisciplinary team emphasizing evidence based practice quality improvement approaches. [Heba Abdel Mowla Ahmed, Eman Abdel Aziz

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I. Introduction

One of the greatest challenges today is not about keeping up with the latest high- technology apparatus's or clinical procedures instead, it is about delivery safer care in complex and pressurized health care environments in which things can often go wrong. In addition, adverse events occur unintentional, but serious harm comes to patients during routine clinical practice or because of clinical decision. Approximately 50,000-100,000 patients die from medical, nursing errors annually in the USA [1-4]. Many countries in the world have already recognized that patient safety and prevention of harms is very important and are establishing approaches to improve the quality of care and ensure safe health services.

Quality improvement (QI) is a systematic, formal approach to the analysis of practice performance and efforts to improve performance. It is a continuous process involving all levels of the organization working together across departmental lines to produce better services for health care clients. Quality patient care services will be achieved as the result of positive interactions among departments working together to build a dynamic mechanism that continuously improves the processes and outcomes of health care services.

Many view quality health care as the overarching umbrella under which patient safety resides. For example, the Institute of Medicine (IOM) considers patient safety "indistinguishable from the delivery of quality health care." [1] Ancient philosophers such as Aristotle and Plato contemplated quality and its attributes. In fact, quality was one of the great ideas of the Western world. [2] Reviewed multiple conceptualizations of quality and concluded with a very abstract definition: "Quality is an optimal balance between possibilities realized and a framework of norms and values." This conceptual definition reflects the fact that quality is an abstraction and does not exist as a discrete entity. Rather it is constructed based on an interaction among relevant actors who agree about standards (the norms and values) and components (the possibilities). [3]

The growing concern with healthcare of safety appeared in the late 1980s. In this sense recently, it is notable that patient safety is considered as a cornerstone of quality of care in health care and its success and achievement requires health care team commitment, where nurses can prevent harm to patients and improve patients' outcomes. The scenario of safe practice in healthcare, where errors and adverse events have become targets of major concern worldwide which compromise patient safety, however, efforts to stop the damage caused by unsafe assistance remain insufficient.

Patient safety

A definition for patient safety has emerged from the health care quality movement that is equally abstract, with various approaches to the more concrete essential components. Patient safety was defined by the IOM as "the prevention of harm to patients." [1] Emphasis is placed on the system of care delivery that (1) prevents errors; (2) learns from the errors that do occur; and (3) is built on a culture of safety that involves health care professionals, organizations, and patients. [1-10]

Measuring Safety

Darker and colleagues (2011) [11] developed a framework for measuring patient safety in two categories. The first is valid rate-based measures that are readily available to answer the questions "How often do we harm patients?" and "How often do we provide the interventions the patient should receive?" (Darker, et al., 2011, p. 1603). The second category includes indicators that are essential to patient safety but cannot be measured as valid rates to answer the questions "How do we know we learned from defects?" and "How well have we created a culture of safety?" (Darker et al., 2011, p. 1603).

Patient Safety Culture

Patient safety culture has been defined as "the values shared among organization members about what is important, their beliefs about how things operate in the organization, and the interaction of these with work unit and organizational structures and systems, which together produce behavioral norms in the organization that promote safety". [12] Investigation of the existence of what they term a "patient safety chain." researchers collected data from 371 hospitals across the U.S. and found empirical evidence that indeed such a chain exists. Improving patient safety begins at the highest level of the organization with a transformational leadership style, which leads to the creation of a culture of safety, the adoption of patient safety initiatives, and ultimately, to improved patient safety outcomes. [14]

There are three main components of a safety culture: learning culture, just culture, and reporting culture. First, a learning culture is one that learns from errors, near misses, and other identified safety issues. Second, a just culture is a culture of trust, a culture in which what is acceptable and not acceptable is defined,

and fairness and accountability are critical components. [15, 16] Finally, a reporting culture encourages and facilitates the reporting of errors and safety issues, and commits to fixing what is broken. The three components are intertwined – without a just culture, having minimal reporting; without reporting, there are no opportunities to learn and improve safety. [17] Review of the literature on the culture of safety and identified seven subcultures of patient safety culture: leadership, teamwork, evidence-based care, communication, learning, just, and patient centered. [18]

In addition, investigation of the safety climate as perceived by nurses and physicians in five dialysis units in three cities in Saudi Arabia. The results indicated that the nurses had a higher perception of the patient safety climate than did the physicians, while both groups felt that there was a stronger commitment to safety from clinical area leaders than from senior leaders in the organization. [19, 20]

Patient Safety Culture and Patient Safety

Patient safety culture has been shown to be related to healthcare clinician behaviors, such as reporting adverse incidents [21] to patient outcomes such as fewer adverse events in [22] and patient mortality in intensive care units [23], and to positive assessments of care by patients. [24]. Further studies showed that the relationship between patient safety culture and patient safety indicator data from 91 hospitals in 37 states. [25, 25, 27] Their findings indicated that higher levels of patient safety culture were associated with higher safety performance and those hospitals in which employees reported more problems with fear of shame and blame had a significantly higher risk of safety problems. They also found that a better patient safety culture was associated with a lower risk of patient safety issues when the patient safety culture was measured as perceptions of frontline personnel but not when measured by the perceptions of patient safety culture by senior management. [28, 29, 30] After studying the impact of the nursing shortage on hospital patient care as perceived by direct care nurses, chief nursing officers (CNOs), physicians, and hospital chief executive officers (CEOs). When asked how often they would say the nurse shortage that existed at the time had an adverse impact on safe patient care, direct care RNs said 65% of the time, physicians 36%, CNOs 26%, and CEOs 17%. There were differences in perceptions identify gaps that could be important barriers to safe patient care. If, for example, CEOs do not perceive that a shortage of nurses affects patient safety, they are far less likely to allocate human and fiscal resources to alleviate the shortage. [31, 32]

Measuring Patient Safety Culture

Several measures of patient safety culture and the various elements of patient safety culture have been developed. Examples include the Safety Attitudes Questionnaire [33], the Patient Safety Culture Improvement Tool [34], and the patient safety culture tools developed by the Agency for Healthcare Research and Quality (AHRQ). [35]

Improving Patient Safety and Patient Safety Culture

The designing healthcare processes for safety involves a three-part strategy: [36] designing systems to prevent errors from occurring, designing procedures to make visible the errors that occur, and designing procedures to mitigate the harm to patients from errors that are not intercepted or are not detected. The experience of the aviation industry is a source for many patient safety strategies. The Federal Aviation Administration (FAA) defines a safety management system as “the formal, top-down business approach to managing safety risk, which includes a systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies, and procedures”. [37, 38] The further notes that the safety management system “is a structured process that obligates organizations to manage safety with the same level of priority that other core business processes are managed”. [39] The safety management system is comprised on four functional components:” that include; first component, **Safety policy** that means establishes senior management’s commitment to continually improve safety; defines the methods, processes, and organizational structure needed to meet safety goals. [40] The second one, **Safety risk management** that means determines the need for and adequacy of new or revised risk controls based on the assessment of acceptable risk. Third component is **Safety assurance** to evaluate the continued effectiveness of the implemented risk control strategies; supports the identification of new hazards. Finally, the fourth component is **Safety promotion** which includes training, communication, and other actions to create a positive safety culture within all levels of the workforce”. [41]

Therefore, it is crucial to have a safety culture to deal with nursing errors with reporting mechanisms that prevent human errors and correct system failure. [42] One-step of this process is to educate nursing professional students on the concepts of quality of life and safety in health care system and how to implement it in their practice. [43] Research conducted at University of British Columbia in Canada revealed that “students remember what they learn from patients and the authentic and autonomous patient’s voice promotes the learning of patient- centered care”. [44]

The World Health Organization (WHO) developed a “Patient Safety Curriculum Guide for Nursing Schools”; this guide aimed to assist in implementing a comprehensive patient safety curriculum for undergraduate nursing schools and, in addition, globally improve the status of patient safety and sequentially to prepare students for safe practice (WHO, 2009). [45] In response to that, many pieces of research were conducting to assess the knowledge, perception and attitude of nursing students regarding this topic. Many accreditation bodies have recognized the urgent need for **patient safety education** for healthcare students, but to date there has been sporadic attention to undergraduate/graduate nursing programs. Nursing students themselves have identified quality and safety of care as an important area of instruction; as future nurses and healthcare leaders, they must be prepared to practice safe healthcare. [46, 47, 48] Nursing education has yet to fully embrace patient safety concepts and principles into existing nursing curricula. Universities are continuing to produce graduate doctors lacking in the patient safety knowledge, skills and behaviors thought necessary to deliver safe care. [49] A significant challenge is that patient safety is still a relatively new concept and area of study; thus, many nursing educators are unfamiliar with the literature and unsure how to integrate patient safety learning into existing curriculum. Nursing students have identified the absence of patient safety education. Association for Nursing Education in Europe⁷ recommended that patient safety education be integrated from the start of existing undergraduate courses. [50]

Nursing students and patient safety

Patient safety education and training is required learning for all levels of training but particularly during the early years when students are establishing the foundations for their clinical practice. They need underpinning knowledge about patient safety as well as know how to apply the principles and concepts at the bedside. [51] Students can begin to learn practical lessons about patient safety as soon as they enter the classroom, ward or clinic. Patient safety should not be approached as yet another subject to teach; rather, it applies to all areas of clinical medicine. Being aware that errors occur is not enough. A safe practitioner integrates patient safety concepts and principles into their clinical practice. [52] This requires more than classroom teaching: it requires teachers to demonstrate how they act to keep patients safe. [53] By helping students to recognize each patient as an individual and to see how that patient’s safety depends on more than any one person’s clinical skills in isolation, nursing students themselves can be role models. [54]

As future nurses and leaders, the nursing students must be aware of the multiple factors that influence healthcare outcomes and act to reduce the opportunities for errors. [55] They need to know how the system of healthcare operates and affects the quality and safety of healthcare. How ready are nursing schools for patient safety education? Patient safety is a complex topic, which includes new areas of knowledge such as human factors, systems, and root cause analysis and risk reduction. Its principles and concepts apply to all areas of nursing. [56] This makes it a challenge to teach and to integrate into the nursing curriculum. [57] The literature on patient safety education in nursing schools is underdeveloped and shows that patient safety teaching is varied and ranges from single-session interventions [92] to educational programs fully integrated across all years of school-based training. [58] Some nursing schools have adapted a modular approach to patient safety education, delivering content in either a single session or several sessions within a narrow timeframe; others have introduced 1- or 2-day intensive courses. [59] While these are pragmatic ways of introducing new material without major curricular redesign, patient safety and its education are ideally integrative in nature. [60] Very few nursing schools have an integrated approach with examples describing patient safety teaching across two existing blocks (6 months) of a second-year nursing programs, across an entire second year of another programs, and even across all the years of nursing training. [61] Many more nursing schools teach patient safety than are described in the literature; however, this is far from universal. Some nursing faculties and nursing educators are yet to be convinced that patient safety is an essential part of the undergraduate nursing curriculum and remain reluctant to incorporate knowledge that originates from outside medicine, such as systems thinking and quality-improvement methods. [62] A central motivation for the WHO in selecting this project was to encourage and assist nursing schools to develop patient safety education in their nursing schools. [63] One cannot expect nursing schools to redesign or adapt curricula if they are unfamiliar with the requirements of the discipline of patient safety. [64] Nursing educators come from varied backgrounds (clinicians, clinician educators, non-clinician educators, managers, health professionals), and their collective experience is necessary to deliver a rigorous nursing programs. [65] Many are experts in their particular disciplines and usually keep up to date using the accepted professional pathways for their area, but patient safety knowledge requires additional learning outside these traditional routes. To be an effective patient safety teacher, health professionals need the knowledge, tools and skills to enable them to teach about patient safety in their institutions. [66]

Thus, this research was conducted to explore the perception of undergraduate nursing students regarding the patient safety, quality improvement and nursing errors issues before entering the clinical practice.

Research Question:

What are the Perception of Patient Safety, Quality Improvement and Nursing Errors Issues among Undergraduate Nursing Students in the selected areas as mentioned before?

Aims of the Study:

This study is intended to describe the perception of undergraduate nursing students regarding the patient safety, quality improvement and nursing errors issues before entering the clinical practice.

1. Explore students' knowledge of patient safety and nursing errors issues.
2. Explore students' awareness of the importance of the concept of quality improvement of care.
3. Identify the preferred methods to learn about these topics.
4. Add a piece of research to the literature and to help local nursing schools and hospitals in decision-making.

II. Material And Methods

Research design:

Descriptive design was used to carry out this study.

Setting:

The study was conducted in Faculty of nursing, Alexandria University, Egypt.

Subjects:

A convenient sample of 100 adult male and female nurse's students from first year of nursing students from the previously mentioned setting throughout a period of seven months from March 2016 to October, 2016.

Tool for data collection:

Based on review of literature the researchers developed a structure questionnaire sheet for data collection. It includes three parts.

Part I:

Soci-Demographic Characteristics which including five questions related to Bio-sociodemographic characteristics as age, academic educational level, gender, previous knowledge about patient safety formal or informal way, previous knowledge about nursing errors formal or informal way and previous knowledge about Quality improvement formal or informal way.

Part II:

Undergraduates Nursing Students' Knowledge Related to Patient Safety and Nursing Errors. The knowledge level rated (1) Strongly disagree, Disagree (2), Neutral (3), Agree (4) and Strongly agree (5) It includes 9 questions about the types of nursing error, Factors contributing to nursing error, factors influencing patient safety, ways of speaking up about error, ways of report a nursing error, and the role of the healthcare institutions (e.g. hospitals, general or primary care practitioners) in error reporting. In addition, if there courses about creating safety culture and dealing with nursing errors should be formally taught to undergraduate nursing students. Furthermore, questions related to patient safety and nursing errors

Part III:

Quality improvement in health care illustrated the opinions related to topics about quality improvement should be taught to undergraduate nursing

Methods:

Official permission to carry out this study was obtained from the previously mentioned setting.

Pilot study:

It was carried out after the development of the tool on 25 % of the sample size (25 nurses' students) and those not included in the final study. This study was formulated with the following objectives: test the clarity of the questions, test the validity and applicability of the study tool, accommodate the aims of the study to actual feasibility, identify the difficulties that may be faced during the application, as well as study all the procedures and activities of the administrative aspects. In addition, the time of completing the questionnaire was estimated during this pilot study to be 10 minutes. The necessary modifications according to the results obtained were done, so some statements were reworded. In addition, the structure of the questionnaire sheet was reformatted to facilitate data collection. Data was collected through structured questioner sheet to fill information related to demographic data, Students' Knowledge Related to Patient Safety and Nursing Errors and Quality improvement

in health care illustrated the opinions related to topics about quality improvement should be taught to undergraduate nursing

Ethical and administration consideration:

The Ethical Committee of the faculty of nursing approved the research. An official permission and official letter was obtained from the administrator of the pre-mentioned settings to get the permission for data collection and program implementation. The purpose and the nature of the study was explained to the participants. The participants were informed that they had the right to withdraw from participation and were assured that the results would be used only for the purpose of the study. A written format explaining the purpose of the research was prepared to be signed by the nurses' students. In order to maintain confidentiality, questionnaires were made anonymous.

Fieldwork:

After making the necessary modification to ensure the clarity of the study tool, the actual data collection was started from March 1, 2016 to the end of October 2016.

Limitations of the study:

Some of students were busy for teaching and some of them not have a time so we were wait a lot of time to start a session and repeated the sessions many times.

Statistical analysis:

After data collection, it was coded and transformed into a specially designed format to be suitable for computer feeding. Following data entry, checking and verification processes were carried out to avoid errors of data entry. All statistical tests were completed using the Statistical Package for Social Sciences (SPSS) version 20 for windows. A 5 % level of significance was chosen where $p \leq 0.05$ was considered significant.

III. Results

Table 1: Presents frequency distribution of undergraduates' Nursing students in relation to demographic characteristics.

In relation to undergraduates' nursing students' sex, the highest percentage was female 62.0 %. The mean \pm SD age was 18.44 ± 0.56 years. Regarding the academic educational level, all students attended the first year in the faculty of nursing.

Table 1: Frequency Distribution of Undergraduates' Nursing Students in Relation to Demographic Characteristics.

Demographic characteristics	Number (N)	Percent (%)
Sex		
Male	38	38.0
Female	62	62.0
Total	100	100
Age Mean \pm SD	18.44 \pm 0.56	

Table 2: Shows frequency distribution of undergraduates' Nursing students in relation to previous knowledge about patient safety, nursing errors and quality improvement.

Regarding nursing students' previous knowledge about patient safety, 21.0% of nursing students have no knowledge while 40.0% of them have knowledge from the internet. Followed by lectures in the college (14.0%). In relation to nursing students' previous knowledge about nursing errors, 30.0% of them have no knowledge while 32.0% have knowledge from the internet. On the other hand, 5.0% have knowledge from informal lectures. As regard quality improvement, 36.0% of nursing students have no knowledge while 40.0% of them have knowledge from the internet and 2.0% from informal lectures.

Table 2: Frequency Distribution of Undergraduates’ Nursing Students in Relation to Previous Knowledge about Patient Safety, Nursing Errors and Quality Improvement.

Previous knowledge	Number (N)	Percent (%)
Patient safety		
No -	21	21.0
Yes -		
If yes:		
Lectures in the college -	14	14.0
Informal lectures -	5	05.0
Books -	9	09.0
Internet -	40	40.0
Math media -	11	11.0
Total	100	100
Nursing errors		
No -	30	30.0
Yes -		
If yes:		
Lectures in the college -	10	10.0
Informal lectures -	6	06.0
Books -	8	06.0
Internet -	32	32.0
Math media -	14	14.0
Total	100	100
Quality improvement		
No -	36	36.0
Yes -	64	64.0
If yes:		
Lectures in the college -	3	3.0
Informal lectures -	2	2.0
Books -	10	10.0
Internet -	40	40.0
Math media -	9	9.0
Total	100	100

Table 3: Illustrates frequency distribution of undergraduates’ nursing students’ knowledge in relation to patient safety and nursing errors:

Regarding the level of awareness of patient safety and nursing errors, the nursing students rate their knowledge as 41% of them agreed regarding different types of nursing error while 8% strongly disagreed as well as disagree. 47% of nursing students agreed that factors were contributing to nursing error while 7% strongly disagreed. As regard factors influencing patient safety, 40% agreed while 3% strongly disagreed. In addition, 38% of them agreed on the ways of speaking up about the error, but only 2% strongly disagreed. On the other hand, 32% disagreed how to report a nursing error while 29% were neutral the role of health care institutions in error reporting.

Table 3: Frequency Distribution of Undergraduates’ Nursing Students Knowledge in Relation to Patient Safety and Nursing Errors:

Level of knowledge	Strongly disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Strongly agree (5)		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Different types of nursing error	8	8.0	8	8.0	27	27.0	41	41.0	16	16.0	100	100
Factors contributing to nursing error	7	7.0	12	12.0	13	13.0	47	47.0	21	21.0	100	100
Factors influencing patient safety	3	3.0	6	6.0	23	23.0	40	40.0	28	28.0	100	100
Ways of speaking up about error?	2	2.0	15	15.0	32	32.0	38	38.0	13	13.0	100	100
How to report a nursing error	12	12.0	32	32.0	24	24.0	26	26.0	6	6.0	100	100
The role of the healthcare institutions (e.g. hospitals, general or primary care practitioners) in error reporting	8	8.0	21	21.0	29	29.0	27	27.0	15	15.0	100	100

Table 4: Illustrates frequency distribution of undergraduates’ nursing students’ perception in relation to patient safety, nursing errors and quality improvement:

Firstly, regarding patient safety and nursing errors, 45.0 % of nursing students agreed that most health care practitioners make errors while 6.0% strongly disagreed. 38.0% of them agreed that nursing errors are very common while 7.0% were strongly disagreed. On the other hand, 30.0% of nursing students disagreed that blame someone rather than focus on the causes of error is easy while 4.0% strongly agree. 42.0% of nursing students agreed that it is unusual for patients to be given the wrong drug while 12.0% were strongly disagreed.

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In addition, 48.0% of nursing students agreed that telling others about an error is easy while 4.0% were strongly disagreed. Regarding nursing students' perceptions about filling in reporting forms will help to improve patient safety, 48.0% and 64.0% were strongly agreed that learning from mistakes could prevent incidents. In addition, 41.0% agreed that concentrating on the causes of incidents could contribute to patient safety. It was noticed that, 40.0% agreed that learning how to recognize and deal with errors before the clinical clerkship is important and 38.0 % strongly agreed on the importance of learning how to recognize and deal with errors before the graduation from the nursing school. Secondly, in relation to the quality improvement, 29.0% of nursing students were neutral regarding the meaning of quality improvement in health care, and 36.0 % were neutral about the awareness of what are the clinical quality indicators. In addition, 37.0% strongly agreed the importance of quality improvement for their future as a nurse while 3.0% strongly disagreed 48.0% of nursing students agreed that quality improvement efforts could increase the quality and effectiveness of care while 13.0% were neutral. In addition, 43.0%agreed that is learning about quality by the end of nursing school is important.

Table 4: Frequency Distribution of Undergraduates' Nursing Students' Perception in Relation to Patient Safety, Nursing Errors and Quality Improvement:

Nursing Students Perception	Strongly disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Strongly agree (5)		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Patient Safety and Nursing Errors												
Most healthcare practitioners make errors.	6	6.0	13	13.0	32	32.0	45	45.0	4	4.0	100	100
Nursing error is very common	7	7.0	22	22.0	17	17.0	38	38.0	16	16.0	100	100
It is easier to blame someone rather than focus on the causes of error	29	29.0	30	30.0	14	14.0	23	23.0	4	4.0	100	100
It is very unusual for patients to be given the wrong drug.	12	12.0	15	15.0	16	16.0	42	42.0	15	15.0	100	100
Telling others about an error I made would be easy	4	4.0	15	15.0	13	13.0	48	48.0	20	20.0	100	100
I believe that filling in reporting forms will help to improve patient safety	5	5.0	2	2.0	16	16.0	48	48.0	29	29.0	100	100
If I keep learning from my mistakes, I can prevent incidents.	2	2.0	2	2.0	2	2.0	30	30.0	64	64.0	100	100
By concentrating on the causes of incidents, I can contribute to patient safety.	2	2.0	5	5.0	22	22.0	41	41.0	30	30.0	100	100
It is important for me to learn how to recognize and deal with errors before the clinical clerkship (in the preclinical years)	0	0.0	7	7.0	16	16.0	40	40.0	37	37.0	100	100
It is important for me to learn how to recognize and deal with errors before the graduation from the nursing school.	0	0.0	7	7.0	19	19.0	36	36.0	38	38.0	100	100
quality improvement												
Aware of the meaning of quality improvement in healthcare.	5	5.0	19	19.0	29	29.0	24	24.0	23	23.0	100	100
Quality improvement is important to my future as a nurse.	3	3.0	7	7.0	17	17.0	36	36.0	37	37.0	100	100
Quality improvement efforts can increase the effectiveness of care.	0	0.0	8	8.0	13	13.0	48	48.0	31	31.0	100	100
Quality improvement efforts can increase the equity of care.	0	0.0	6	6.0	13	13.0	48	48.0	33	33.0	100	100
Aware of what are the clinical quality indicators.	2	2.0	25	25.0	36	36.0	21	21.0	16	16.0	100	100
It is important for me to learn about quality by the end of nursing school	3	3.0	1	1.0	13	13.0	43	43.0	40	40.0	100	100

Table 5: Illustrates frequency distribution of undergraduates' nursing students' thinking in relation to courses of patient safety, nursing errors and quality improvement formally taught:

The majority of nursing students (95%) were preferred the formal course about the patient safety, nursing errors and quality improvement.

Table 5: Frequency Distribution of Undergraduates' Nursing Students' thinking in Relation to Courses of Patient Safety, Nursing Errors and Quality Improvement formally taught:

Student's thinking	Number (N)	Percent (%)
Patient Safety and Nursing Errors		
No -	5	5.0
Yes -	95	95.0
Total	100	100
Quality Improvement		
No -	5	5.0

Student's thinking	Number (N)	Percent (%)
Patient Safety and Nursing Errors		
Yes -	95	95.0
Total	100	100

Table 6: Illustrates frequency distribution of undergraduates' nursing students' thinking in relation to the formal methods to learn courses of patient safety, nursing errors and quality improvement:

As regard, nursing students thinking about the formal method for teaching courses for patient safety, nursing errors and quality improvement, 98.95 % of students were rate the lecture method as very helpful for patient safety and nursing errors while 92.64 % reported that lecturer is very helpful for quality improvement. The seminars method was rated as very helpful for patient safety, nursing errors and quality improvement (89.48 % and 83.16 %) respectively. On the other hand, 74.74 % of students preferred real life examples of safety issues and nursing errors presented by physicians' method while 94.7% preferred this method for quality improvement. In relation to independent computer modules method, 76.85 of students rated it very helpful for patient safety and nursing errors while 85.27 % for quality improvement. In addition, 78.95% of nursing students rated standardized patient case as very helpful methods for teaching patient safety and nursing errors. 87.37% of nursing students rated the independent study on patients' safety and nursing errors including reading method as very helpful and 84.22 % of them rated the same methods for quality improvement courses. In addition, 89.84% of students rated that problem-based learning in which small group works as very helpful for quality improvement courses.

Table 6: Frequency Distribution of Undergraduates' Nursing Students Thinking in Relation to The Formally Methods to Learn Courses Of Patient Safety, Nursing Errors And Quality Improvement:

Methods	Not helpful (1)		Helpful (2)		Very helpful (3)		Total	
	N	%	N	%	N	%	N	%
I- Patient safety	1	1.05	00	0.0	94	98.95	95	100
Lectures that introduce patient safety.								
A set of seminars to present and discuss this topic	10	10.52	00	0.0	85	89.48	95	100
Real life- examples of safety issues and nursing errors presented by physicians.	24	25.26	00	0.0	71	74.74	95	100
Computer modules that introduce patient safety completed independently by students.	22	23.15	00	0.0	73	76.85	95	100
Standardized patient case in which you are required to disclose nursing errors.	20	21.05	00	0.0	75	78.95	95	100
Independent study on patient safety that includes readings and reflection.	12	12.63	00	0.0	83	87.37	95	100
II- Quality improvement	7	7.36	00	0.0	88	92.64	95	100
Lectures introducing quality improvement.								
A set of seminars to present and discuss this topic.	16	16.84	00	0.0	79	83.16	95	100
Real life- examples of quality improvement projects presented by physicians.	5	5.26	00	0.0	90	94.74	95	100
Computer modules that introduce quality improvement completed independently by students.	14	14.73	00	0.0	81	85.27	95	100
Faculty-guided quality improvement project on a fake cohort of patients	40	42.11	00	0.0	55	57.89	95	100
Faculty-guided quality improvement project with a cohort of real patients.	11	11.57	00	0.0	84	88.43	95	100
Independent study on patient quality improvement that includes readings and reflection.	15	15.78	00	0.0	80	84.22	95	100
Problem-based learning in which small group works through a quality improvement case.	10	10.52	00	0.0	85	89.48	95	100

IV. Discussion

It is clear that clinicians and health-care managers are still looking for methods to improve safety, quality and efficiency of their work. [67] As in other service industries, the focus in health care shifts from the structure to the process to the outcome. Nurses are an integral member of the health care team and are in a unique position to detect quality of care issues and providing processes for change that improve quality and safety in health care. [68] Quality and Safety Education for Nurses (QSEN) addresses the challenge of preparing nurses with the competencies necessary to continuously improve the quality and safety of the health care systems in which they work. [69] At the core of nursing lies incredible historical will to ensure quality and safety for patients. Therefore, the current study was conducted to explore the undergraduate nursing students' perception of patient safety, nursing errors issues and the concept of quality improvement. [70]

The results of the present study revealed that all undergraduate nursing students attended the first academic year in the faculty of nursing. Regarding the sources of the previous knowledge about patient safety,

quality improvement and nursing errors, the majority of nursing student reported that source from the internet, which is considered as a one of an informal source of knowledge. The findings are in line with other studies, which revealed that there is no specific formal curriculum related to quality improvement and patient safety introduced to the undergraduate nursing students. Stevens (2005) et al [71] reported that despite the increasing focus on patient safety in clinical practice it is slow to achieve strategic recognition in medical and nursing education. In addition, Smith and Sherwood (2007) and Bezold (2005) [72,73] propose that medical and nursing students have a lack of the skills necessary to improve patient safety. In addition, the finding that patient safety is not explicitly addressed in the undergraduate nursing students' curriculum is consistent with Attree et al (2008). [74]

In relation to knowledge of nursing student about patient safety and patient safety, the majority of them were agree with a knowledge about types of nursing errors, factors contributing to nursing errors, factors influencing patient safety, ways of speaking up about the error and how to report a nursing error while they were neutral with the role of the healthcare institutions such as hospitals in the reporting of errors. These data are in accordance with Nabilou et al (2015) [75] who compare the perception, knowledge and attitudes between the medical and nursing students' in relation to patient safety and the study revealed that nursing students obtained significantly higher scores on perception towards patient safety than medical students. On the other hand, Edgman-Levitan (2013) and Lorig (2011) [76,77] argue that patient safety will only improve if the organizational and professional cultures accept the inevitability of error and importance of reporting and learning.

Regarding the perception of nursing students' in relation to patient safety, nursing errors and quality improvement, the majority of students had a perception about nursing errors and how to deal with error and importance of learning about patient safety, nursing errors and quality improvement by the end of nursing school. Moreover the majority of nursing student were preferred the formal methods including lectures, seminars and real life examples as well as problem-based learning in which small group work very helpful for quality improvement courses. These finding explain that these methods of educations will improve the knowledge, skills and attitude of nursing students regarding patient safety and quality improvement. LindekeL (2005) [78] and Miller et al (2008) [79] emphasized on students' confidence in their knowledge and skills related to patient safety will be improved with the implementation of safety education into both classroom and clinical settings. These data are in accordance with recommendation of Steven (2014) [80], which reported that patient safety and patient outcomes are dependent on the educational preparation of nurses. These findings were congruent with Cronenwett et al (2009) [81] pointed out that to assure new graduate competencies in patient safety, quality improvement and patient- centered care, all of nursing education must embrace the need for change. Thus, it is clear from the forgoing discussion that it is essential to provide education on the fundamental of patient safety, nursing errors and quality improvement to undergraduate nursing students during their lectures and training to reduce the risk of harm and improve the quality of care.

V. Conclusions

Healthcare professionals are caring people, and it is often hard for them to match patient safety data with their perceptions and desires of how care is delivered. Nursing staff are the most important component of patient safety and prevention of nursing errors. Focusing on attitudes, performance and knowledge of nursing students is necessary for a successful plan for patient safety and make the quality improvement sustainable. To assure new undergraduate nurses competencies in patient safety, quality improvement and nursing errors issues, all of nursing education must embrace the need for change. The commitment to patient safety and patient safety cultures must be strong enough to be able to move quickly to the last stage of data reality, to accept the challenge and the responsibility of ensuring that patients are safe when they are in our care, and to do all in our power and beyond to create patient safety cultures that nurture and support the our staff and our patients. The issues of patient safety, nursing errors and quality improvement should be taken into consideration as a key element of the faculty of nursing. These competencies cannot be mastered through a didactic approach nor developed in a single course or web-based module. Not only are nurses responsible for providing safe patient care, all health care profession are also responsible for creating an environment in which others can provide safe patient care, and for being the last line of defense when needed between the patient and potential harm. Having a deep understanding of patient safety and patient safety culture allows nurses to be the leaders that improve the quality of care

VI. Recommendations

Undergraduate nursing educational needs assessments and faculty are beginning to address safety issues in new ways, such as medication errors involving students. In addition, undergraduate nurses should know about human factors and safety design principles, understand the importance of error reporting and safety cultures, and value vigilance and cross monitoring among patients, families, and members of the health care team. Establishing formal curriculum on patient safety, nursing error and quality improvement is essential.

Furthermore, Faculty of Nursing should take seriously their role in preparing nurses to deliver safe care to patients. The bulk of the focus, however, is on teaching students the knowledge they need to care for individual patients, with limited—if any—emphasis on the immense system problems in safety. Also formulate and design policies for quality improvement will reduce all types of nursing error and maintain patient safety. Reflective papers and case studies should be used to deepen understanding of the values and attitudes required for quality and safety work. Every clinical instructor should engage differently with the inter-professional team on patient care units where they are teaching and simulation cases should be included as a form of teaching methods for patient safety and prevention of nursing errors. For further research, it is important to investigate the self-reported confidence in learning about patient safety in the classroom and different clinical settings of undergraduate nursing student.

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