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Dr. Nandaprakash P, MSc (Nursing), Ph. D (Nursing)

Editor in Chief, IJONE

From the Editor's Desk: Value of Nursing Practice

I would first like to thank the authors, editorial board and the reviewers for the commendable July 2023 issue of International Journal of Nursing Education. As nursing has matured and the issue of value in health care has now become the lifeblood of Indian healthcare system, this contribution could not be more timely or vital.

I am eager to reflect on the authors' call for nurses to incorporate into their practice the responsibility to call out low value care and efficient, cumbersome administrative processes that inhibit nurse's ability to provide coordinated, high-value patient care. I am reminded that value occupies two poles at each end of any continuum. At one pole, value is advanced through the efforts of those who have a strong commitment to making a difference, having an impact, improving conditions and circumstances, and raising the quality of the human experience. Each of these are fundamental and historical drivers for the practice of nursing.

The authors have captured well both the elements and processes associated with an ethically grounded, outcomes-driven, cost-effective, and value-based nursing practice. They have also emphasized that after the past two years of the pandemic the innumerable gaps that have long existed in the health care system now make it clear that it is in both the nurses' and health systems' interest to not return to a pre-pandemic reality if we are to advance the interests of a more mutually-rewarding health future.

This corresponds to my 32 years of experience as a nursing professional. Little seems to have changed. As I look back at the important publications of those times, late 1990s and early 2000s, related to the themes of both workforce and value, one would see recurring conversations yet precious little movement.

Value advancement and sustainability are inextricably linked. Nurses have the potential, when supported by size, location, and their centrality to all manner of health care delivery, to play a key role in addressing and aligning the determinants for a healthy future. The capacity for nurses to contribute to this aim is undeniable.

However, at the other end of the value pole are issues related to nurses themselves. The question is: what is the real value of nursing? A cursory review of nurses' institutional history indicates that nursing has always been identified only as a cost center in nursing resource management over the several decades of Indian health care. This means that the mental model, management processes, structural framework, operational mechanics, and financial ledger, validate that nurses have always been managed "on the margin."

According to a 2022 WHO report, "Nurses have finally learned their worth," a health system chief executive elucidated nurse's reality in starker terms: "Nursing has always been a burnout profession. The work is hard. It is physical and emotional; hospitals build in shortages into their business model, keeping their staffs lean and their labor costs down"

More recently, the Economics Times reported that honourable Prime minister of India Narendra Modi ji urged people to show their appreciation to all nursing staff for their exceptional work even in the most challenging of situations Their deep commitment to protecting lives and public health is commendable He appreciated them for their dedication and compassion, which he said were exemplary.

Jack Needleman, PhD, professor and chair of the department of health policy and management at the UCLA Fielding School of Public Health said in the May 18 issue of Medscape News: “executives only see that nurses are one quarter of hospital costs and thus a cost center to be managed rather than a service line to be promoted and enhanced.” Throughout my 50 years as a nurse, 45 of those years in some capacity of nursing leadership, along with many of my other nursing leadership colleagues, I have been fighting the prevailing notion of nursing as “a labor cost.” Let’s face it, cost and value simply sit on different sides of the ledger.

Within this contextual framework, any value nurses might produce generally accrues to the institution; I do agree that value is an anchor for the hospital/nursing relationship. However, currently, only indirectly, does the value equation directly positively impact most nurses. It is virtually impossible to become a value producer when little in your presence or your work has any quantifiable value directly linked to the product of that work. As a result, at best, a nurse’s value is as a “cost controller,” a sort of margin circuit rider limited to addressing the cost s/he may or may not have played any part in generating. This restricts the nurse to addressing financial cost functions in a way that at best maximizes the margin between cost and contribution.

There is little quantifiable and measurable value identified with nursing’s impact on fiscal contribution and its impact on quality and clinical outcome (the producer and product element of the value equation). What in this circumstance would ever motivate the nurse to engage in the cost savings efforts of a system whose very design normatively generates continuously accelerating costs (including increasing nursing work demands) in pursuit of late-stage treatment processes which have done little to accelerate the net aggregate health of the nation at any discernable level of sustainable value? Though the largest expense in the system, most nurses, day in and day out, struggle to hold themselves and the health system together in the face of accelerating demands and tightly allocated human and support resources.

In order to truly be envisioned as a contribution center in any value equation, nursing must, in some way, move to the revenue (value) side of the ledger. I intuit that there are several major steps to which nurses must commit to make this happen:

- 1. Redefine the value generated through nursing:** Using macro and micro clinical and financial data, nurses must create their own unique value algorithms that link social, clinical, financial, and practice factors that demonstrate nursing practice impact evidenced in social, behavioral, fiscal, and health status metrics that clearly enumerate nursing specific value.
- 2. Link financial value to clinical contribution:** It is essential to aggregate evidence of value in a way that links intentional models or algorithms of practice with current real practices to demonstrate significant incremental value creation. This should also clearly substantiate the fiscal risks associated with failing to undertake indicated effective practice changes driving financial value associated with clinical contributions.
- 3. Engage in the discussion that links value-based reforms and determinants of health:** The national effort to build on value-based payment reforms and relating them to the social determinants of health is leading to the creation of a relational and intersecting set of processes which, for the first time, get at the broad cost-value interchange which includes nurses. Nurses should be at the design table as these service/payment formulas unfold.
- 4. Advocate the importance of nursing in the overall healthcare system:** Nurses must claim ownership over the central role we play in health care. Nurses bring creative and innovative practice insights and applications to everything we do. It is necessary now for nurses to not only name this space as theirs but to demonstrate how that ownership contributes to advancing health and establishing its impact to those we serve and with whom we serve.

Nobody more than nurses experienced the traumas of the global health system and the losses it both exhibited and exacerbated during the COVID-19 pandemic. We have much work to do; a systemic change is needed and an active engagement by the nursing profession to demonstrate its value in creating a healthy society.

A Comparative Study to Assess the Perception and Gratification Towards Traditional and Virtual Learning Experiences among the Nursing Students During Covid 19 Pandemic, In a Selected Nursing College, Bangalore

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Abstract

Introduction: The COVID-19 has led to a drastic shift in holistic educational system into online mode, but its usefulness in teaching medical and nursing course is questionable. Assessing nursing students' perceptions and level of gratifications with web-based learning system has been a critical issue.

Methodology: A quantitative study approach and descriptive study design was adopted to assess the perceptions and level of gratifications towards traditional and virtual learning experiences among the nursing students during a Covid-19 Pandemic. The sample consists of 140 nursing students who are having exposure to both traditional as well as virtual learning experiences, which were drawn using the probability sampling technique (simple random- lottery method). The data were collected through the administration of structured questionnaire, which consists 15 demographic questions, 28 Perception statements (towards traditional learning 14 & virtual learning 14), 16 Gratification statements (towards traditional learning 8 & virtual learning 8). Data were analyzed by using Descriptive & Inferential statistics.

Results: The study results revealed that with respect to virtual learning 42(30%) had positive perceptions and 98(70%) had negative perceptions, and with regard to traditional learning 139(99.29%) had negative perceptions and only one (0.71%) had positive perceptions. In addition, with regard to virtual learning 125(89.29%) were moderately satisfied, 12(8.57%) were highly satisfied and 3(2.14%) had a low level of satisfactions, and with respect to traditional learning experiences, 115(82.14%) were moderately satisfied, 23(16.43%) were highly satisfied, and 2(1.43%) had a low level of satisfaction.

Conclusion: Based on the findings of the study, it was concluded that while the empirical status of online learning studies is somewhat disappointing, online learning experiences have revolutionised learning and teaching. Virtual learning also has advantages and can enhance the nursing education learning experience, but it needs to be delivered correctly.

Keywords: Perception, Gratification, Traditional Learning Experiences, Virtual Learning Experiences.

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Introduction

“Education is the passport to the future, for tomorrow belongs to those who prepare for it today.”- Malcolm X

The 21st century has brought about an enormous change in the world of Education.

Contemporarily the internet has not only brought about a paradigm shift in the fundamental way in which learning is done but also has taken learning beyond the hallowed walls of the universities and into the palms of everyone.¹

Although one of the first instances of online learning in the world can be traced back to 1960, at the University of Illinois, the University of Toronto offered USA, the first-ever completely online course in 1984. Later in 1986, the Electronic University Network was established for being used in DOS and Commodore 64 computers. In 1989, the University of Phoenix became the first educational institution in the world to launch a wholly online collegiate institution, offering both bachelors and master's degrees, during 1990s.¹

According to Meyen et al. (2012), e-learning is defined as the ‘acquisition and use of knowledge distributed and facilitated by electronic means’, a definition which centred on knowledge acquisition. According to Khan (2005), e-learning can be defined as ‘an innovative approach for delivering well designed, learner-centred, interactive, and facilitated learning environment to anyone, anyplace, anytime by utilizing the attributes and resources of various digital technologies along with other forms of learning materials suited for open, flexible, and distributed learning environment’.²

Experts predict that the next wave of online education will occur not in North America and Europe, but newly emerging markets like India, Africa and China as the current COVID-19 pandemic has put fuel into the fire.² India has been one of the hardest-hit countries by COVID-19. Beyond the staggering impact on human life, COVID-19 has greatly disrupted access to education in India. While some believe that the unplanned and rapid move to online learning -with no training, insufficient bandwidth, and little preparation- will result in a

poor user experience that is uncondusive to sustained growth.

In many countries, including India, traditional classroom teaching has to be suspended to ensure the safety of students, lecturers, and patients. To minimize the impact of lockdown and to continue with their professional curriculum, fortunately current technology enabled virtual learning to be the core method of teaching during this COVID 19 pandemic.^{3,4}

Traditionally, online learning perceived as lack interactivity compared to face-to-face learning. It is mainly due to the lack of social presence, social interaction, and lacks of students' satisfaction.⁵ However, online learning has been promoted as being more cost effective and convenient than traditional educational environments as well as providing opportunities for more learners to continue their educations.⁶ The Virtual Whiteboard, can be in the form of Miro, Stormboard, or Google Jamboard. Document sharing and editing can be done using Google Docs, or MS Office 365. Note taking can be on One Note or Google Keep. File sharing can be made with Dropbox or Google Drive.⁷

At present scenario, online learning is booming and expected to grow rapidly in the near future. The worldwide market size of online learning is approximately \$187.87 billion in 2019, which denotes a 400% increase over what it was just six years ago. This phenomenal growth has been made possible not only just by the rapidly evolving scenario in the world of technology, but also by the spread of education in the developing world.¹

In professional courses such as nursing, hands-on practical learning, clinical postings, and patient interactions later in the curriculum play a crucial role in gaining skills. However, the Pandemic Period does not warrant conventional face-to-face lectures, practical classes, or clinical postings for the students as it can unnecessarily expose them to the novel coronavirus unknowingly.^{3,8}

It is not an easy task to shift from something that is comfortable. However, the shift can be made foreseeable, if we know how to make small and incremental changes. In view of the pandemic situation, online teaching is justifiable but its

usefulness in teaching medical and nursing courses is questionable as assessing nursing student's perceptions and level of gratification with web-based learning systems has been a critical issue.

The aim of the present study is to assess the perception and gratification towards traditional and virtual learning experiences among the nursing students, who are having the exposure to both traditional as well as virtual learning modes during pandemic.

Hence the objectives of this study were- to assess and compare the perception & the level of gratifications of nursing students towards traditional & virtual learning experiences, to determine the correlation between traditional and virtual learning experiences and to determine the association of socio-demographic variables with traditional and virtual learning experiences among nursing students.

Background & Purpose of the study:

The COVID-19 pandemic has disrupted the traditional educational system and led to a drastic shift into online mode of education. The same has reflected in professional education of nursing too. The purpose of this study is to evaluate and compare the perception and gratification towards traditional & virtual learning experiences among nursing students.

Materials and Methods

RESEARCH APPROACH: Quantitative research approach to assess the perceptions and level of gratifications towards traditional versus virtual learning experiences among nursing students.

RESEARCH DESIGN: Descriptive Research Design.

RESEARCH VARIABLES: Perceptions and level of gratifications are the two research variables.

DEMOGRAPHIC VARIABLES: It includes information about age, gender, course of studying, area of residence, marital status, type of family, father's and mother's education, family income per month, ever received online class before lockdown, type of gadgets used for online class, type of network services, access to uninterrupted network services, should online class be continued, duration of online class per day.

SETTINGS OF THE STUDY: Narayana Hrudayalaya College of Nursing, Bangalore.

SAMPLE: Nursing students who were in Year II & III GNM, Year III & IV BSc were considered a sample.

SAMPLE SIZE: The sample size was calculated using statistics as well as software version 1.0. A sample size of 140.

SAMPLING TECHNIQUE: Probability Sampling Technique - Simple Random Sampling (Lottery Method) was used to select the samples for the study.

SAMPLING CRITERIA:

Inclusion criteria: Nursing students those who were studying in II & III year GNM, III & IV year BSc, willing to participate in the study.

Exclusion criteria: Nursing students those who were not- exposed to both virtual & traditional learning methods, present at the time of the study.

DESCRIPTION OF TOOL:

Part 1: Baseline data of respondents includes:

Section-A: Socio-Demographic information of the respondents

Section-B: Virtual class accessibility of nursing students.

Part 2: Likert Scale was used to assess Perceptions of respondents towards traditional and virtual learning method, which includes two sections:

Section-A: Perceptions statements on Virtual Learning Experiences (VLE)

Section-B: Perceptions of respondents towards Traditional Learning Experiences (TLE).

Part 3: Semantic Differential (SD) scale was used to assess level of gratifications towards traditional and virtual learning experiences, which includes two sections:

Section-A: Level of gratifications of the respondents towards Virtual Learning Experiences (VLE)

Section-B: Level of gratifications towards Traditional Learning Method (TLM).

CONTENT VALIDITY OF TOOL: The prepared questionnaire along with the methodology has been

given to eight experts. The Content Validity Index was 0.85.

RELIABILITY: Inter-Rater Method of Reliability scoring(r')- Perceptions (VLE)-0.79, Perceptions (TLE)-0.85, Level of Gratifications (VLE)- 0.77, Level of Gratifications (TLE)- 0.92, which shows the tool was considered as statistically reliable for main study.

PROCEDURE FOR DATA COLLECTION:Structured interview schedule was used to distribute the tool and mark the response.

PLAN FOR DATA ANALYSIS:Descriptive statistics &inferentialstatistics.

Results and Discussion

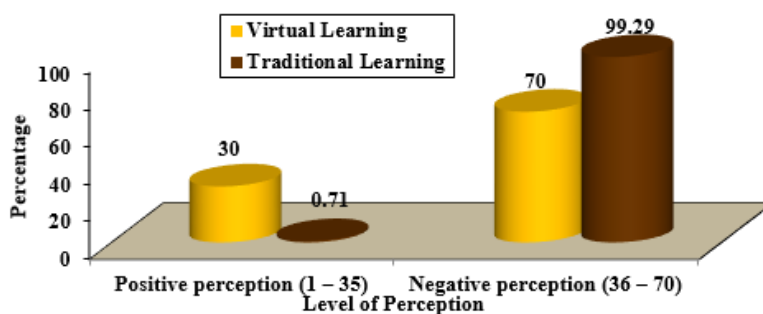


Fig 1: Frequency and percentage distribution of perceptions towards virtual learning experiences and traditional learning experiences among nursing students.[N=140]

The present study suggested that only 30% had positive perceptions towards virtual learning experiences and with regard to traditional learning method 99.29% had negative perceptions.

Another contrast study showed that 53.4% of the nursing students had positive perceptions towards online learning.⁹

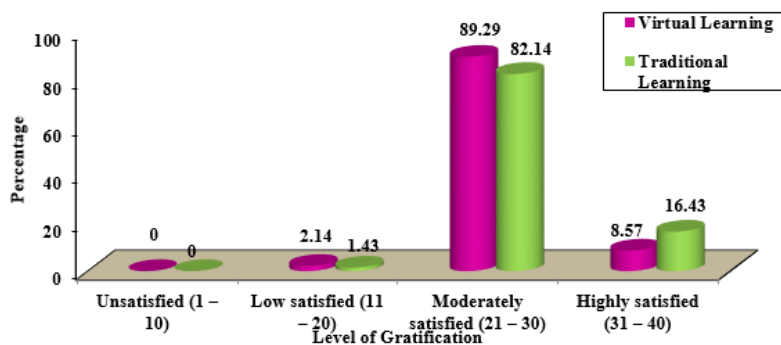


Fig 2: Frequency and percentage distribution of level of gratifications towards virtual learning experiences and traditional learning experiences among the nursing students. [N=140]

According to this study, 89.29% were moderately satisfied, with online learning and 82.14% had moderate level of satisfaction with traditional learning.

A similar study suggested no statistically significant difference in satisfaction level was found between those enrolled in the two different learning modes.¹⁰

Table 1: Comparison of perceptions towards virtual learning experiences and traditional learning experiences among the nursing students. [N=140]

Level of Perceptions	Virtual Learning		Traditional Learning	
	Frequency	Percentage	Frequency	Percentage
Positive perceptions (1 - 35)	42	30.0	1	0.71
Negative perceptions (36 - 70)	98	70.0	139	99.29

*** $p < 0.001$, S - Significant

Table 2: Comparison of level of gratifications towards virtual learning method and traditional learning method among the nursing students. [N=140]

Level of Perceptions	Virtual Learning		Traditional Learning	
	Frequency	Percentage	Frequency	Percentage
Positive perceptions (1 - 35)	42	30.0	1	0.71
Negative perceptions (36 - 70)	98	70.0	139	99.29

**p<0.01, S - Significant

This study also clearly inferred that perceptions and level of gratifications towards traditional learning was found to be higher than the virtual learning among the nursing students. A similar study revealed

that online learning works as a temporary alternative due to COVID-19, it could never substitute face-to-face learning.¹¹

Table 3: Correlation between perceptions and level of gratifications towards virtual learning and traditional learning among nursing students. [N=140]

Type of learning	Variables	Mean	S.D	Karl Pearson's Correlation Value
Virtual learning	Perceptions	38.72	7.81	r = 0.221
	Level of gratifications	26.44	3.00	p=0.009, S**
Traditional learning	Perceptions	50.80	5.92	r = 0.203
	Level of gratifications	27.41	2.94	p=0.016, S*

**p<0.01, *p<0.05, S - Significant

This study also showed that there was a low positive correlation between perceptions and level of gratifications.

Table 4: Association between perceptions and level of gratifications towards virtual learning with selected demographic variables

Perceptions	Level of gratifications
Course of study ($X^2=5.072$, $p=0.024$), S*	Marital Status ($X^2=6.733$, $p=0.035$), S*
Area of residence ($X^2=7.004$, $p=0.030$), S*	Type of family ($X^2=8.862$, $p=0.012$), S*
Marital status ($X^2=4.013$, $p=0.045$), S*	Ever received virtual class before ($X^2=7.014$, $p=0.030$), S*
Family income ($X^2=10.617$, $p=0.014$), S*	Type of gadgets used ($X^2=38.587$, $p=0.0001$), S***
Continuation of virtual class ($X^2=6.199$, $p=0.013$), S*	Type of network services ($X^2=21.395$, $p=0.006$), S**

Table 5: Association between perceptions and level of gratifications towards traditional learning with selected demographic variables

Perceptions	Level of gratifications
Continuation of virtual class ($X^2=4.029$, $p=0.045$), S*	Age ($X^2=25.127$, $p=0.0001$), S***
—	Duration of attending virtual classes per day ($X^2=13.779$, $p=0.008$), S**

There was a statistically significant association between demographic variables course of study,

area of residence, marital status, family income, and continuation of virtual class with **perceptions**, and

marital status, type of family, type of gadget used, ever-received virtual class before, type of network services with **level of gratifications** towards **virtual learning**. In addition, the demographic variable continuation of virtual class had a significant association with **perception** and age; durations of attending online classes had an association with **level of gratifications** towards **traditional learning**.

Conclusion

The result of the study proved that besides the traditional learning virtual learning method was essential for an independent, high quality, flexible model of education. Traditional classes provide a stimulating environment that provides both theoretical and practical aspects of learning. Along with traditional classes, virtual classes also act as a viable option and enhance the learning experiences in nursing education.

Ethical Clearance: Taken from NH Medical Ethics Committee.

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Conflict of Interest: Nil.

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Electrocardiogram Visual Tutorials for Nurse Practitioner Students

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Abstract

Background: The ability to interpret electrocardiograms (ECG) is diagnostically important, both for medical doctors and for nurse practitioners in primary-care settings. The process of learning to read complex rhythm strips and 12-lead ECGs can be very frustrating for students; teaching it can be challenging for some faculty members. Of the many available textbooks and online courses, most are excellent and all have something to offer. However, many nurse practitioners in primary care lack confidence in their ability to identify abnormalities in ECG strips correctly.

Methods: A quasi-experimental, one group pretest-posttest research design was used to determine the effectiveness of the intervention. Overall, 637 student-nurse practitioners from one university participated in the study. A quiz was used to evaluate the participants' ability to interpret electrocardiograms and their scores were collected as pretest data. The students took part in an intervention that consisted of video lessons and associated quizzes. Their scores from a later quiz on electrocardiogram interpretation were collected as posttest data.

Results: A paired samples t-test was conducted to assess the difference between pretest and posttest scores. The results revealed a statistically significant difference between pretest and posttest scores, $t(636) = 59.713, p = 0.000$. The mean difference was 49.330, indicating that the students significantly increased their ability to interpret electrocardiograms as a result of participating in the intervention.

Conclusion: Online visual tutorials were an effective means of teaching student-nurse practitioners to interpret ECGs.

Keywords: Electrocardiogram (ECG), ECG teaching methods, nurse practitioners, ECG interpretation

Introduction

The ECG process is a vital clinical-test procedure performed in primary care. The ability to interpret electrocardiograms (ECG) is an important diagnostic skill, not only for medical doctors but also for nurse practitioners in primary-care settings. However, it can be very frustrating for nurse practitioner students to learn to read complex rhythm strips and

12-lead ECGs; the topic can also be challenging for faculty members to teach. Consequently, many nurse practitioners in primary care lack confidence in their ability to correctly identify abnormalities in an ECG strip, despite the availability of several textbooks and online courses.¹ However, primary care "providers are instrumental in identifying abnormalities on ECGs for further evaluation and life-saving treatments. As

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the population ages, the incidence of abnormalities expressed on ECGs grows significantly, which poses a challenge to providers".² The ability to interpret electrocardiograms correctly in clinical practice is an important skillset nurse practitioner are generally expected to possess.

Nurse practitioners face many challenges in trying to interpret ECG readings correctly during clinical practice, owing largely to deficits in training. Student nurse practitioners find it difficult to memorize the volume of information needed to interpret every strip accurately, including the ECG axis and rhythm.³ Textbooks and online courses are either too basic or difficult for some learners of ECG. As a consequence, nurse practitioners face many challenges in trying to interpret ECG readings correctly during clinical practice.

Erroneous interpretations of electrocardiogram readings in medical practice can lead to adverse patient outcomes.⁴ When the electrocardiogram signals that emanate from damaged electrodes are analyzed, there is a significant risk that providers will make diagnostic errors when treating patients. Examples include the erroneous identification of anteroseptal infarction, anterior infarction, and ventricular hypertrophy.⁵ As a result, life-threatening misdiagnoses can be made.

Educators in the field of clinical practice have embraced many methods to teach students to read ECGs and increase confidence. Continuous exposure has been shown to increase the confidence levels of medical students during multiple ECG-interpretation exercises conducted in the presence of faculty facilitators.⁶ Visual tutorials are one method used to train nurse practitioners to read and interpret electrocardiograms correctly. Nurse practitioner educators can use visual tutorials to increase practitioner students' ability to retain information during weekly ECG-interpretation exercises. As the electrocardiogram-related competence of nursing practitioners is extremely critical, it is important to analyze the teaching methods that educators use to impart the curriculum and essential ECG-interpretation skillsets to student-nurse practitioners.

To evaluate the effectiveness of visual tutorials, student-nurse practitioners in a Historically Black

University in the Southwestern region of the United States used an online visual tutorial to learn to interpret ECG readings correctly. This article examines the effectiveness of visual tutorials in enhancing ECG interpretations by student-nurse practitioners.

The EKG module was a class assignment and student consent was not obtained. Results were de-identified prior to running the statistical analysis.

Literature Review

ECGs are among the most important and widely used medical tests. Consequently, there is a clear focus on the extent to which medical graduates are able to make and interpret correct electrocardiogram readings after completing the undergraduate medical curriculum. When medical practitioners misinterpret ECGs, they risk making the wrong clinical decisions, which can lead to serious adverse medical outcomes, especially in relation to myocardial infarction and arrhythmias.⁴

Findings based on a study of medical-student interpretations of ECG readings have shown that many students lack confidence during ECG-interpretation exercises.⁷ The most disturbing finding is that most medical students cannot interpret electrocardiograms correctly, especially when faced with life-threatening clinical emergencies, such as atrial fibrillation and complete cardio block.⁷ Medical practitioners who major in cardiology, emergency medicine, and internal medicine are also moderately incompetent at interpreting electrocardiograms.⁷ These results are concerning because the ability to interpret ECGs is a key skill in daily medical practice.

An electrocardiogram analysis is a detailed examination of electrocardiogram tracing, which typically requires the proper evaluation of every waveform and rhythm and the correct measurement of intervals. ECG interpretation is defined as the determination reached once the process of ECG analysis is complete.³ ECG competence is a medical practitioner's ability to analyze and interpret ECGs correctly. The process of understanding ECG concepts is commonly referred to as ECG knowledge.³

However, both medical students and nurse practitioners find the process of analyzing and interpreting ECGs very daunting at times. One reason

is that nurse practitioners are generally required to have a sound understanding of the physiology and anatomy of the cardiovascular conduction system before studying ECGs. In addition, students cannot analyze ECGs without understanding vectors and how they are impacted by pathology and lead placement.⁸

Another study showed that medical students needed two types of logical thinking to interpret ECGs: a non-analytical logical pattern that recognizes both rhythms and abnormal waveforms; and analytical thinking that includes a systematic analysis of all 12-lead ECGs.⁷ Although nurse practitioners can achieve the best clinical results when simultaneously employing both ways of thinking when interpreting ECGs, many find this overwhelming. Although the ability to interpret ECGs accurately depends on students' levels of clinical exposure, there is a need to supplement the entire ECG-interpretation training process through a structured teaching method.

Visual tutorials have been shown to facilitate students' learning about ECG analysis and interpretation. The rising use of visual tutorials to teach ECG interpretation in medical school can be attributed to the increased digital literacy of students in the education sector since the advent of computers and smartphones.³ Visual tutorials enable tutors to teach more students effectively, helping them retain information more easily and for longer periods of time. Recent meta-analyses have confirmed the importance of visual tutorials in conveying healthcare curricula, and especially ECG interpretation.³ Properly assessing the competence level of students who have been trained using particular methods makes it possible to develop key objectives, which must be achieved for the tutoring to be a success. By testing the student-nurse practitioners' ability to interpret and analyze ECGs, it is possible to measure their skillsets and ECG competency.

The visual tutorial model can be used immediately, with delayed assessment methods after a learning intervention.⁴ Conducting an assessment shortly after the student acquires knowledge can make it easier to test a student's level of ECG competence. By contrast, a delayed assessment checks the student's ability to retain knowledge associated with ECG

competence. The Kirkpatrick model is a widely accepted testing method that medical educators use to gauge the effectiveness of visual tutorials in ECG-interpretation training.⁹ This model is known for properly measuring student assessments of the learning experience, acquired skillsets, the ability to transfer learning to actual clinical emergencies, and the impact of the student learning process on patients.

The effectiveness of the visual learning method should not be measured without factoring in other important determiners of the learning process. They include the environment in which the tutoring process is carried out, for example in a clinical setting, classroom, or computer laboratory.³ Another determiner is the distribution of studied material (e.g., distributed vs. massed instruction), which has a direct impact on student retention.³

A range of learning theories can explain the different types of tutoring methods. These can be classified as instrumental, humanistic, transformative, and social-learning approaches. The instrumental-learning approach emphasizes the importance of learning through practice, stating opinions, and reinforcing taught content. The humanistic learning approach steers the student-learning process intrinsically, rather than through extrinsic motivation. The transformative-learning approach emphasizes the student's ability to reflect critically. The social-learning approach encourages collaborative learning through direct interactions between students and tutors.¹⁰

Visual tutorials are used in instrumental, humanistic, and transformative teaching approaches to transmit ECG knowledge to students, making them particularly effective.¹¹ The visual-learning approach enables nurse practitioners to visualize the medical situations they are likely to face when administering ECGs to patients. Furthermore, being able to pause visual tutorials helps students understand and retain information on ECG methods. Proper assessments are needed to identify and correct the key weaknesses associated with visual tutorials in limiting social interactions between nurse practitioners and educators. It is therefore important to increase the extent to which faculty members use this learning method effectively.

Methods

The present study uses a quasi-experimental, one-group, pretest-posttest research design to determine the effectiveness of the intervention. Pretest-posttest designs are used to measure the change that results from experimental treatments.¹² This study measures changes in the students' ability to interpret electrocardiograms, providing a vehicle for assessing the impact of educational interventions based on the visual tutorial modules. The specific research question that guides this study is as follows: Does ECG online visual tutorials improve participants' ability to interpret electrocardiograms?

The participants were graduate students enrolled in the Family Nurse Practitioner program at a historically black university in the Southwestern region of the United States. Data were collected from 637 student-nurse practitioners for seven academic years, enrolled in clinical rotations. A pretest was administered to participants at the beginning of the course. Throughout the course, the students participated in several video lessons designed to help them analyze ECGs with confidence. Following each video lesson, the students were quizzed on the content of the video lessons. They also viewed several online

videosthat provided a practical "how-to" approach to a real cardiac rhythm strip. They were then quizzed on the content of the those videos. At the end of the course, the participants took a posttest that served as the final examination to evaluate the study's primary outcome, change in ECG reading and interpretation knowledge/competence.

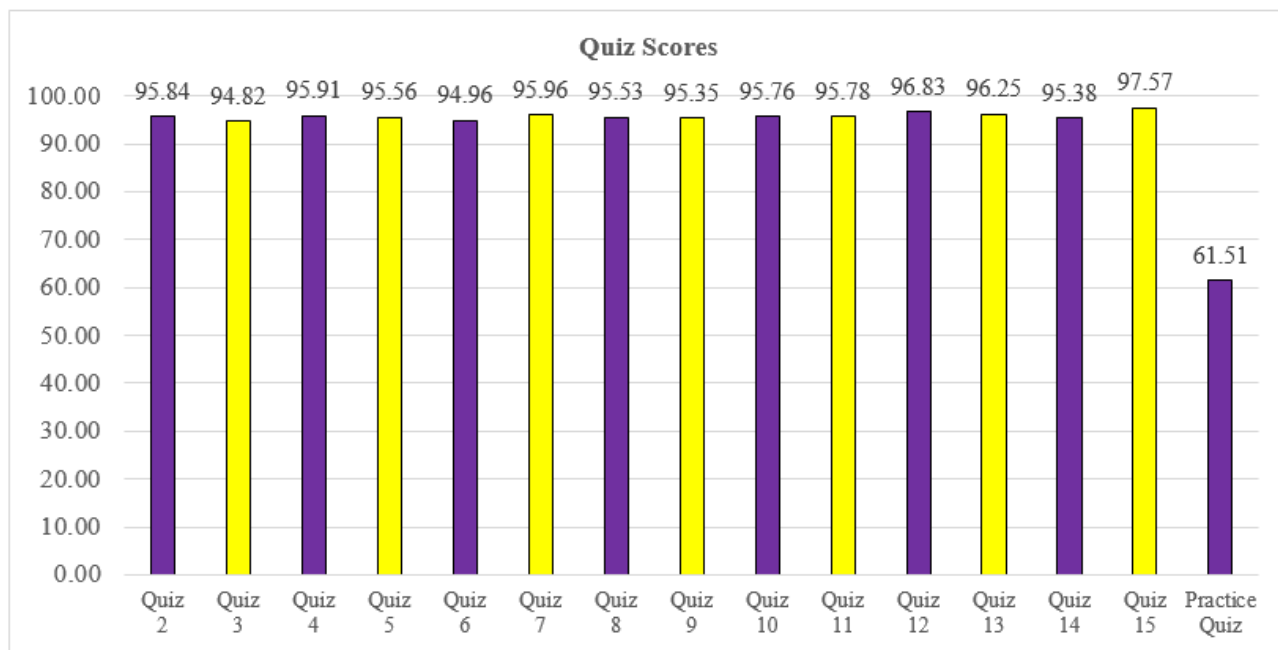
Results

Overall, 637 students completed the pretest and posttest in this study. Table 1 presents the mean pretest and posttest scores, which are 41.87 and 91.20, respectively.

Table 1. Pretest and posttest descriptive statistics

	N	Mean	Std. Deviation
ECG Pre-test Quiz	637	41.87	16.107
Level 1 Final Exam	637	91.20	13.228

As previously stated, students participated in video lessons, followed by quizzes, as an intervention designed to improve their ability to interpret electrocardiograms. Figure 1 presents the students' mean scores for the video-lesson quizzes and the practice quiz.



A paired samples t-test was conducted to determine whether there was a statistically significant difference between the pretest and posttest scores.

Table 2 presents the results of the paired samples t-test.

Table 2. Results of the paired samples t-test.

	Mean Difference	Std. Deviation	t	Sig.	Effect Size (Cohen's d)
Level 1 Final Exam - ECG Pre-test Quiz	49.330	20.850	59.713	.000	3.35

The results of the paired samples t-test reveal a statistically significant difference between the pretest and posttest scores, $t(636) = 59.713$, $p = 0.000$. The mean difference is 49.330, indicating that the students significantly increased their ability to interpret electrocardiograms by participating in the intervention. Furthermore, the effect size of the study is 3.35, showing that the intervention led to an extremely large effect.

IMPLICATIONS FOR PRACTICE

The use of visual tutorials to teach nurse practitioners the ECG skillset has numerous implications for generating positive impacts in clinical practice. As a result, visual-tutorial teaching has quickly replaced older learning methods. Some educators have also created a hybrid ECG teaching method that uses traditional and visual learning methods in tandem.⁴ The extent to which student-nurse practitioners engage in studying ECGs has also increased.

Visual tutorials expand the knowledge that students acquire at the pre-intervention stage of ECG procedures. Student-nurse practitioners acquire a significant amount of information by reviewing visual tutorials that depict pre-intervention stages. No traditional study models present nurse practitioners with such opportunities because they allow only theoretical explanations of the procedures that students must follow. Furthermore, the huge amount of data consumed by nurse practitioners at the pre-intervention stage of any clinical condition can significantly help practitioners perform ECGs on patients, effectively increasing their survival chances.

Conclusion

The use of visual tutorials in ECG tutoring can minimize the rate at which future nurse practitioners give erroneous ECG readings and interpretations. It is widely known in medicine that misinterpreted ECG readings can jeopardize patient health. When doctors and nurse practitioners misread ECGs,

they generally make diagnostic errors, erroneously identifying conditions such as anteroseptal infarction and anterior infarction in their patients. This causes them to administer the wrong treatments, increasing their patients' health risks. The potential effectiveness of visual tutorials in helping students interpret ECGs can save many lives in clinical practice by significantly reducing erroneous ECG readings and interpretations.

The use of visual tutorials to teach nurse practitioners ECG-interpretation skills can increase patients' levels of trust in practitioners, particularly when they are administering ECG tests. Visual tutorials can strengthen the confidence of nurse practitioners during the ECG learning process. Confidence levels increase when nurse practitioners confront various clinical conditions via visual tutorials that teach them to perform electrocardiograms. The increased confidence levels of nurse practitioners during ECG administration allow patients to trust their actions, enhancing the positive relationship between nurse practitioners and their patients.

Nurse practitioners conduct ECG procedures while treating numerous clinical conditions in daily practice and emergency situations. As a result, accurate ECG-interpretation skills are needed to enhance medical-team performance during treatment. Visual tutorials offer a simple way for working nurse practitioners to refresh their ECG-interpretation skillsets effortlessly. In addition, visual tutorials allow practitioners to refresh their skillsets and provide much-needed flexibility in their everyday duties. This enables nurse practitioners to maintain high standards when conducting electrocardiogram procedures.

The results of this study show a huge improvement in the ECG competence of student-nurse practitioners, outpacing traditional modes of teaching. The findings of this assessment show that students easily understand and retain information taught using visual modes of **teaching, as opposed to older teaching methods. The use of visual**

tutorials to teach the nursing curriculum has a high success rate, with the potential to introduce other forms of visual tutoring, such as virtual reality. These significantly expand the clinical experiences of practitioners. Just as visual tutorials have been shown to be more effective than traditional teaching methods, educators must engage actively with students during the ECG learning process, given the technical nature of electrocardiogram exercises.

Ethical Considerations: The study was approved by the Institutional Review Board of Prairie View A&M University, Office of Research Compliance, Prairie View Texas, with IRB Protocol #2023-009.

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Conflict Of Interest: Nil

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The Severity of Social Anxiety Disorder among Nursing Students at the University of Tabuk

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Abstract

Background: Social Anxiety Disorder (SAD) or known as social phobia is an excessive fear of interacting with people and a fear of being evaluated negatively by others. The person has extreme concerns about being exposed to possible scanning and social fears or performance situations in which embarrassment may occur.

Objective: This study aimed to measure the severity of social anxiety disorder and its associated factors among nursing students.

Methods: This is a descriptive, cross-sectional study. The participants were 138 nursing students of the University of Tabuk. Data were collected using a SPIN self-administered questionnaire.

Results: The findings revealed that the prevalence of SAD among the nursing students was very severe (2.2%), severe (6.5%), moderate (13.0%), mild (18.1%), and no social phobia at 60.2%. This showed no significant relationship between the severity of SAD across the demographic profile ($P > 0.05$).

Conclusion: About 40% of nursing students suffered from mild to severe social anxiety disorder which may affect their academic performance. Nursing leaders should conduct awareness programs and educational activities to lessen SAD among nursing students.

Keywords: Social Anxiety Disorder, SAD, Social phobia, Nursing Students, Saudi Arabia

Introduction

The prevalence of social phobia varies between different countries and cultures with a reported rate of 7-13% in western countries, 10% in India, and 11.7% in Saudi Arabia¹. Social Anxiety Disorder (SAD) or known as social phobia is an excessive fear of interacting with people and a fear of being evaluated negatively by others. The person has extreme concerns about being exposed to possible scanning

and social fears or performance situations in which embarrassment may occur. It is frequently comorbid with other anxiety disorders such as depression, disruptive disorders, and substance use². Researchers believed that the etiology emerged from the combination of genetic and environmental influences and usually developed between early adolescence and the age of 25 with a higher prevalence of specific phobias in the general population, especially in children⁷.

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The concept of social phobia has been used to describe a patient who is scared of being watched while talking in public, or speaking to another gender, and has symptoms of shame, isolation, and worst experiencing physical symptoms of anxiety^{3,7}. If symptoms of SAD are heightened or continue to experience social anxiety, this will lead to significant work, educational, and interpersonal impairments in adulthood². Social phobia patients do not suffer from skill impairment but they suffer from anxiety that prevents them from the proper use of skills in social interactions or performance impairment. With this, student nurses may affect their soft skills in interaction with their respective patients which may improve through strengthening the nursing students' communication skills to treat social phobia⁴.

A study in Saudi Arabia was conducted to know the prevalence of SAD among 1447 medical students with a result of 92.2 % suffering from mild to very severe social phobia with 20.3% very severe cases for females while 19% for male¹. Similar high prevalence results for female students (16.3%) suffered SAD in Taif University which is also associated with obesity, smoking, and parental death with a $P < .001$ ²¹. Another cross-sectional study was conducted in Abha, Saudi Arabia with a 59.5% prevalence rate of social phobia among medical students which also affects students' academic performance such as avoiding oral presentations, poor performance in clinical examinations, and an overall educational performance⁹.

There is a high prevalence of social phobia among health sciences students (31.2%) in Ghondar, Ethiopia with and highly correlated to female, poor social support, first year students, and living in rural area⁵. Though there is a high prevalence of SAD (39%, 30% and 16%) corresponding to mild, moderate and severe respectively among adolescent students in Oduduwa College, Ile-Ife, Osun state, Nigeria, however, there is no significant association with the gender as opposed to the study in ethiopia⁷. A longitudinal study conducted among Finnish adolescent students showed a consistent relative association of social phobia among male with poor educational progress and problem in interpersonal relationship with their close friends, romantic relationship and poor support system with their

significant others which has a opposite result as to female, however, there is a predictive depressive symptom for both gender¹⁰. The nursing students of the University of Jos in Nigeria suffered extreme social phobia for about 31.1% of the respondents. Moreover, the study concluded that self-esteem may influence and be associated with social phobia.

Social phobia may severely impact nursing students' academic performance both in the theoretical and clinical aspects, thus, may also affect the relationship with their respective patients as a care provider through providing important information such as giving feedback to patients' condition, explaining medical information, and managing patient condition. With the current studies about social phobia, it is apparent that there is a high prevalence of SAD to adolescent students, medical students, and nursing students however there are opposing results to the association of the socio-demographic profile and the occurrence of social phobia. It is also noted in the studies that SAD affects students' performance and interpersonal relationships. The interpersonal relationship is an essential component in improving nursing students' clinical competencies and strengthening nurse-patient relationships. Since there are few research studies about SAD that focus to nursing students in the Kingdom, prompted the researcher to conduct this study to evaluate the extent of severity of social phobia among nursing students in the University of Tabuk to serve as a springboard in creating educational program to reduce if not eliminated this psychological problem of the students.

Method

Research Design & Setting:

This study employed a descriptive- cross sectional design conducted at the Department of Nursing, faculty of Applied Medical Sciences, University of Tabuk. The University is located in the Northern part of Saudi Arabia near the border of Jordan.

Population and Sample

The population of the study were the 230 nursing students in the A.Y 2019-2020. A Raosoft sample size calculator was utilized to compute the sample size of the study which is 145 with 5% margin of error and 95% level of confidence.

Data Collection

Data collection started after the ethical approval from the Department of Nursing from January 01, 2020 to March 31, 2020. Google form was used for the questionnaire together with the informed consent to ease the facilitation of data collection. The consent letter specifically states the purpose of the study, risks and benefits, the procedure of the study, anonymity, and confidentiality of the data taken from the respondents. Contact information was also provided to them just in case of clarifications and questions regarding the study. The retrieval of data was automatically received by the researcher once the respondents submitted after completion of the questionnaire.

Instrument:

The first part of the instrument is the demographic profile of the respondents. The second part is the Social Phobia Inventory (SPIN), structured and adopted with permission to Dr. Jonathan Davidson to utilize as a questionnaire of this study⁶. The Social phobia has a 17 items SPIN scale with cut-off point's ≥ 21 . Its score ranges from 0 to 68, which was rated from 0 (not at all) to 4 (extremely). Scores of 20 and below are generally not indicative of social anxiety. Scores in the 21-30 range are indicative of mild social anxiety. Scores in the 31-40 range are indicative of moderate social anxiety. Scores in the 41-50 range are indicative of severe social anxiety. Scores of 51 and above are indicative of very severe social anxiety⁶.

Data analysis:

The collected data was entered and analyzed using the Statistical Package for the Social Science (SPSS) version 23. Descriptive statistics were performed. Percentages will be given qualitative variables. The determinant factors will be determined using the Chi-square test. P-value will be considered significant if $P < 0.05$.

Ethical considerations:

Ethical Approval was obtained by the Research Ethics Committee of the Department of Nursing. The consent form includes the purpose of the study and the proponent's contact details to answer any clarification, doubts, and questions to maintain non-maleficence throughout the study process. The risk was mentioned, and no financial compensation will

be given to the respondents to prevent bias and ensure justice. The respondents were guaranteed their rights to participate in the study voluntarily without coercion or deception. They were free to withdraw from participation at any time with no consequences. The data were stored, in a safe device, with a secure password to maintain confidentiality. The data were stored in a password-encrypted computer, and any other identifying participant information was in a locked file cabinet in the personal possession of the researcher. Information from this research was used for this project and possible secondary analysis within the period mentioned above.

Results

The research questionnaire reached 142 possible respondents and retrieved 138 valid questionnaires. There were 57.2% female and 42.8 male respondents who participated in the study. The GPA of the students were as follows; < 2 in 0.7%, $2 - 2.99$ in 5.8%, $3 - 3.99$ in 35.5% and $4 - 5$ in 58%. Most of the respondents in the second year comprised 40.6%, followed by the fourth year (39.9%), and the 3rd year got the lowest respondents (19.6%).

Findings shown in table 1 revealed that 60.2% of the respondents has no social phobia and the 39.8% of the respondents suffered from mild to very severe social phobia, which corresponds to; very severe (2.2%), severe (6.5%), moderate (13.0%), and mild (18.1%).

Table 1: Severity of social phobia among nursing students(N=138)

Severity of social phobia		
Parameters	Frequency	Percentage
No social phobia	83	60.2
Mild social phobia	25	18.1
Moderate social phobia	18	13.0
Severe social phobia	9	6.5
Very severe social phobia	3	2.2
Total	138	100.0

Table 2 showed the severity of SAD in relation to the demographic profile. The result yielded that the severity of SAD has no significant correlation across the demographic profile; gender ($P=0.358$), educational year level ($P\text{-value}= 0.817$), and GPA ($P\text{-value}= 0.105$).

Table 2: severity of Social phobia in relation to gender, Educational year level and GPA

	Social phobia					Total (N=138)	P value
	No Phobia (n=83)	Mild (n=25)	Moderate (n=18)	Severe (n=9)	Very severe (n=3)		
Gender							
Female	50	11	10	5	3	79	0.358
	63.3%	13.9%	12.7%	6.3%	3.8%	100.0%	
Male	33	14	8	4	0	59	
Educational year level							
Second	34	12	6	3	1	56	0.817
	60.7%	21.4%	10.7%	5.4%	1.8%	100.0%	
Third	18	5	2	2	0	27	
	66.7%	18.5%	7.4%	7.4%	.0%	100.0%	
Forth	31	8	10	4	2	55	
	56.4%	14.5%	18.2%	7.3%	3.6%	100.0%	
GPA							
less than 2	0	1	0	0	0	1	0.105
	.0%	100.0%	.0%	.0%	.0%	100.0%	
2 -2.99	5	2	1	0	0	8	
	62.5%	25.0%	12.5%	.0%	.0%	100.0%	
3 - 3.99	23	10	12	4	0	49	
	46.9%	20.4%	24.5%	8.2%	.0%	100.0%	
4 - 5	55	12	5	5	3	80	
	68.8%	15.0%	6.2%	6.2%	3.8%	100.0%	

Table 3 shows the Range, Minimum, Maximum, Mean and Std. Deviation Social phobia score in different educational year levels, GPA and Gender

of the studied students. There was no significant difference in Mean social phobia score level in gender, study level and GPA ($P > 0.05$).

Table 3: Range, Minimum, Maximum, Mean and Std. Deviation Social phobia score in different educational year levels, GPA and Gender of the studied students

	Range	Minimum	Maximum	Mean	Std. Deviation	P value
Educational year level						
Forth	54	1	55	21.65	13.768	0.241
Second	51	0	51	18.80	11.993	
Third	49	1	50	18.22	13.051	
GPA						
less than 2	0	27	27	27.00	-	0.163
2 - 2.99	36	1	37	17.00	12.118	
3 - 3.99	43	0	43	21.94	12.719	
4 - 5	54	1	55	18.72	13.151	
Gender						
F	53	2	55	20.39	13.083	0.108
M	46	0	46	19.07	12.783	
Total score						
Total score	55	0	55	19.83	12.925	

Discussion

This study revealed the prevalence of social phobia of the nursing student at the University of Tabuk. The respondents were 138 nursing students of different gender and different educational years. Most of the respondents were females (57.2 %) and males (48.8%) nursing students of the Department of Nursing, Faculty of Applied Medical Sciences, University of Tabuk. The domination of females in nursing is supported with numerous studies in Saudi Arabia¹ and Jordan³. Most of the respondents GPA falls under 4 – 5 (58%) and most of the respondents were second year (40.6%).

The findings revealed that the prevalence of severity of social phobia was very severe in 2.2% of the total students, severe at 6.5%, moderate at 13. %, mild at 18.1% and no social phobia at 60.%. A similar study conducted among medical students in Saudi Arabia in which SPIN was used with the following results, prevalence of SAD was 29% and 24.3% had mild and moderate social phobia respectively, severe and very severe social phobia represented 19.1% and 19.8% respectively, and 7.9% didn't suffer social phobia¹ which is in contrast with the current results of the study. There was a higher prevalence of SAD among the medical students in King Khaled University where very severe was (19.8%), severe (19.1%), moderate (24.3%), and mild (29%)⁹. The variations of results could be the nature of the course, educational level, GPA, and the setting of the study.

In the current study social phobia degree had no effect and no significant correlation with the GPA (P-value= 0.105) with similar result in Finland where there was no significant association between SAD and lowering of GPA during the last year (10), GPA didn't affect by the different severity of social phobia grades with a P-value=0.3(1), and there is no significant correlation between the academic performance in Kerman University of Medical Sciences, Iran¹⁸. However, an opposite result in another study in Saudi Arabia where the medical students who suffered SAD showed lower academic achievements⁹.

This current study revealed a negative correlation between gender and social phobia (P-value= 0.358), with an opposite finding that yielded that male

had higher social phobia scores than females^{5,9}. A study in a western country found that social phobia was more common among females¹². Females were 2.3 times more likely at risk of increasing social phobia compared to male students due to cultural and biological factors that may present in gender differences in social and anxiety disorders⁵ as females are not equally participated in all activities because of cultural influence when compared to males^{13,14}.

This study showed no significant correlation between educational year levels and social phobia (P-value= 0.817). In contrast, the 1st and 2nd-year students were highly at risk of social phobia in other studies where students were forced to live far away from their parents to attend their classes in the University^{15,16}. Students studying in the 1st year were 5.5 times had social phobia compared to 5th-year students⁵. There was a significant difference between different social phobia levels (P-value=0.004) among medical students, where more students in year 3-4 and 5-6 suffered different social phobia levels than those in year 1-2 and year 7¹.

Stress and environmental factors play a role in interpersonal stressors and thus can contribute to the development of social anxiety and differences in background, appearance, language, social and emotional development, all can affect whether or not a student fit in the university¹⁷. Social phobia usually affects some other factors. In India, medical students coming from low socioeconomic class were at high risk of social phobia during their education¹⁹, and school-age adolescents from urban residence had insufficient income families were more at risk of social phobia²⁰.

Conclusion

About 40% of nursing students suffered from mild to severe social anxiety disorder which may affect their academic performance. Moreover, there are no significant correlations between severity of SAD and across the demographic profile of the respondents.

Nursing leaders should conduct awareness programs and educational activities to lessen SAD among nursing students.

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Evaluation of a Comprehensive international web based educational program for Nursing Students During the COVID 19 pandemic

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Abstract

Background: The ongoing COVID-19 pandemic has significantly impacted nursing education in developing and developed countries. In response to pandemic-related challenges such as campus shut downs, nursing schools implemented open and distance learning programs (ODL) that allowed them to continue offering nursing education. This paper reports on an ODL patient safety course implemented during the COVID-19 pandemic that was also used to facilitate an international, cross-cultural learning experience.

Method: Forty undergraduate senior nursing students in the United States (U.S.) and the Dominican Republic (D.R.) enrolled in a synchronous and asynchronous ODL nursing patient safety course implemented by [Blinded] in conjunction with [Blinded].

Results: Thirty-seven students completed all of the program requirements. The majority of students rated their course experience highly; they agreed or strongly agreed with all course evaluation statements, including whether their overall course evaluation was positive (95%) and whether the curriculum was culturally appropriate (97%).

Conclusions: Our experience in implementing a nursing patient safety ODL course can serve as a model for (1) how ODL can help nursing schools respond to restrictions imposed by an ongoing pandemic; (2) how ODL can be used to enhance cross-cultural nursing education; and (3) how nursing schools can collaborate effectively across borders.

Key words: Collaboration, covid, education, international, nursing, online, pandemic, students

Introduction

The COVID-19 pandemic continues to present challenges on a global scale that are significantly impacting nursing education in developing and developed countries¹. Nursing schools worldwide have faced many difficulties in keeping their curriculums up to date and in meeting accreditation standards, while also coping with disruptions

in clinical placements, campus shutdowns and restrictions, stress among faculty, staff, and students, and financial cutbacks². In response to these unprecedented pandemic-related challenges, nursing schools have adapted and implemented learning resources through open and distance learning (ODL) to secure the graduation of competent nurses to the workforce.

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Open and distance learning (ODL) has led to strong performance results regarding their curriculums, academic performance, and technologies employed. Benefits reported for distance, or "e-learning," include flexibility, accessibility, student satisfaction, and cost-effectiveness³. Robust evidence suggests online learning is generally at least as effective as the traditional in-house format^{4,5}. These studies have demonstrated effective content delivery through ODL, and almost all disciplines in higher learning institutions, nursing included, recognize and accept this learning mode.

Further, when implemented on an international scale, ODL also offers the benefit of standardization of study topics. This benefit was especially relevant to the current study, which layered a cross-cultural learning experience into a patient safety ODL course. A focus on patient safety is essential to the functioning of healthcare organizations⁶. The World Health Organization (WHO) estimates that one in every ten patients is harmed while receiving hospital care; of these incidents, nearly fifty percent are considered to have been preventable⁷. While policies and practices to enhance patient safety have been studied and demonstrated to be significant⁷, the COVID-19 pandemic has led to heightened awareness among healthcare institutions and public health departments of safety procedures to prevent the further or massive spread of communicable diseases. Simple yet effective protocols such as hand hygiene have been demonstrated to be critical to preventing the spread of pathogens and infections⁸. Equally important, increased patient safety can lead to significant financial savings for healthcare institutions⁹.

The urgent need to provide safe patient care during a pandemic intersects with the need for cultural competency skills that can help nurses implement safe care practices when working with a diverse patient population. An essential skill for nurses, cultural competence refers to an individual's ability to interact effectively with people from different cultures¹⁰. Unfortunately, not all nursing schools provide their students with cross-cultural learning experiences. In a study examining nurses' perceptions of the importance of cultural competence training, the authors found

that nurses perceived training that increases cultural awareness in health care providers as being useful and thought-provoking¹¹.

This paper describes and evaluates the implementation of an online nursing patient safety course that enrolled students from the United States (U.S.) and the Dominican Republic (D.R.) during the COVID-19 pandemic. The course provides a platform to equip nursing students with foundational knowledge in patient safety, delivered within a context of cross-cultural interaction that can help them begin to develop cultural competency skills. The course's objectives were (1) to strengthen the patient safety education of undergraduate nursing students in the U.S. and D.R. through the completion of an online course with tutors; (2) to disseminate current practices during the COVID-19 pandemic; and (3) to provide a cross-cultural training experience.

Materials and Methods

This article describes a synchronous and asynchronous nursing patient safety ODL course implemented by [Blinded for review] in the U.S. in conjunction with [Blinded for review] in D.R. The study setting was an online classroom for undergraduate nursing students and nursing faculty from the two countries. Two Course Coordinators (one from each institution) designed and implemented the course using a two-group pretest-posttest design. Forty senior undergraduate students enrolled in the course (20 from [Blinded] in D.R. and 20 from [Blinded] in the U.S.). The [Blinded] Institutional Review Board approved the course evaluation.

Course description

The online nursing patient safety course was implemented through the Blackboard course management system within the [Blinded for Review] student portal. The course consisted of 11 modules related to nursing patient safety, 3 discussion boards, 3 webinars, and a final group project presentation. We provided an initial orientation to faculty and students in D.R. because they were not familiar with the virtual platform. To ensure a clear understanding of the program, instructors at each institution held office hours throughout the duration of the course to respond to individual students' questions.

The online nursing patient safety course modules have been completed and evaluated by more than 13,000 nurses and nursing students worldwide and are currently available in English and Spanish⁵. The course is hosted on Moodle, a free and open-source learning management system, and is accessed at patientsafetycourse.org. Nine patient safety solutions are grouped thematically into 7 of the modules, while 4 additional modules cover other topics that are fundamental to the nurse's role in promoting patient safety. Students can also consult a glossary of key terms and a list of additional resources at any point during the course.

Discussion Boards: We provided 3 discussion boards via Blackboard to foster cross-cultural interaction among students from both institutions. Each student was required to write an initial post before reading their classmates' posts, and to comment on at least 2 other posts to obtain the maximum score on the assignment. Students introduced themselves during the first discussion boards and shared information about their backgrounds, career goals, and personal interests such as hobbies. In the second discussion board, students commented on how the "Situation, Background, Assessment and Recommendation" (SBAR) tool improves communication in nursing, and on how they saw themselves using this information-sharing tool in the future to prevent or reduce medical errors. The third discussion board focused on the impact of medication errors on patient care, how these patient medication-related safety issues can be improved, and how the challenges presented by the COVID-19 pandemic contributed to medication errors and affected patient safety.

Webinars. The three online webinars used a global health and cross-cultural lens to examine the impact of the COVID-19 pandemic on various patient safety topics. Three subject experts were selected for their expertise and experience in nursing and health systems. The first speaker was the COO of [Blinded], a public teaching hospital in the U.S., who presented on the [Blinded] Healthcare System's response to the COVID-19 pandemic. The second speaker was a faculty member from the [Blinded] School of Nursing in the U.S., who talked about challenges in nursing education and practice during COVID-19. The final speaker, a faculty member from [Blinded] in D.R.,

discussed strategies to respond to the COVID-19 pandemic in the D.R.

Final Presentations. The patient safety ODL course concluded with synchronized student presentations on the topics of nursing in the U.S., nursing in D.R., the U.S. healthcare system, the D.R. healthcare system, and the impact of COVID-19 in each country. Five small, cross-cultural groups of 7 to 8 students (3 to 4 students from each institution per group) worked together to prepare and deliver their final presentations. Students in the U.S. were able to gather in a classroom setting for all of the presentations, with D.R. students joining in via the Zoom video conferencing platform. Due to COVID-19 restrictions, D.R. students gathered and conducted their presentations via Zoom. Faculty from both institutions provided feedback to the students following their presentations.

Data Analysis

We used descriptive statistics to examine demographic characteristics, and determined demographic differences by site based on independent samples (t-tests for continuous variables and Chi-Square tests of association for categorical variables). We implemented a mixed ANOVA to determine whether knowledge changed as a result of the course and whether the impact of the course on knowledge differed based on site. Site (U.S. and D.R.) was the between-subjects variable and time (pretest and posttest) was the within-subjects variable.

Results

Participant Demographics. Of the 40 students who enrolled in the patient safety ODL course, 39 completed the demographic questionnaire (19 U.S. students and 20 D.R. students) and 37 completed all of the course requirements (19 U.S. students and 18 D.R. students). Almost all of the students (97%) reported that they had never before participated in an international education program (i.e., had never studied abroad or in an international education format such as the patient safety ODL course). The majority of the students were female (95%), and most reported being single (90%) and without children (95%). One-third were first-generation college

students (33.3%), and slightly more than half (52.6%) were not currently working. Most of the students who were working held part-time jobs (89%), but were not working in a hospital or a health-related field (68%). More than two-thirds of participants (68%) reported living in an urban area, while about one-quarter (26%) lived in a rural area. The majority reported having access to a computer (92%). None of these demographic characteristics differed significantly by site.

Participants ranged in age from 20 to 24 ($M = 22.2$, $SD = 1.20$). Age was found to differ significantly by site ($p < .001$), with students in the U.S. being younger ($M = 21.6$) than students in D.R. ($M = 23.5$). Race and ethnicity also differed significantly by site, with more White students in the U.S. and more non-White students in D.R. ($p < .001$), and with more Latinx/Hispanic students in D.R. than in the U.S. ($p < .001$).

Knowledge Pretest and Posttest. We assessed content knowledge before and after the course through a 28-item multiple choice test created by the Course Coordinators. Selection of the test items was guided by the content of the course modules; items include safety issues related to medication administration and reconciliation, pre-procedure verification, the SBAR tool, patient handover, fall risk assessment, patient mobility, pressure ulcers, hand hygiene, and COVID-19.

Of the 40 students who enrolled in the course, 39 completed the pretest and 37 completed the posttest (Table 4). Possible scores ranged from 0 to 100. Overall, the average pretest score was 51.7 ($SD = 16.3$) and the average posttest score was 67.3 ($SD = 11.5$); this improvement in scores from pretest to posttest was statistically significant ($F(1,35) = 49.50$, $p < .001$; Table 1). We also found a significant interaction (Figure 1) between change in scores and site ($F(1,35) = 27.2$, $p < .001$); specifically, while pretest scores were quite different across sites ($MUS = 65.2$, $MDR = 40.1$), posttest scores were more similar across sites ($MUS = 69.0$, $MDR = 65.5$). This finding shows that while students in D.R. began the course with lower pretest scores than students in the U.S., they subsequently

demonstrated significantly greater growth in their scores as compared to students in the U.S.

Course Evaluation. Students completed a 12-item, multiple-choice course evaluation upon conclusion of the course (Table 2). The majority of students agreed or strongly agreed with all statements, including whether their overall evaluation of the course was positive (95%), whether they would recommend the course to a colleague (95%), and whether the course material was presented effectively (95%). Students also evaluated specific components of the course very favorably, with almost all of them agreeing that modules reflected learning objectives (97%); case studies and thinking questions stimulated interest in the course material (97%); the course challenged them to think (95%); they learned something new (100%); the material was culturally appropriate to them personally (97%), the course difficulty was appropriate (97%); quizzes accurately assessed learning (100%); the course was relevant to their nursing practice (97%); and they felt confident that they could apply what they learned to their nursing practice (100%). There were no significant differences across the two sites for any of the evaluation items.

We also invited the students to provide open-ended comments about any aspects of the course. Most of the comments affirmed the value of the ODL course and of the international training experience. Some students affirmed how they had benefited from the cross-cultural format and interaction that was built into the course. Students commented on how they could see themselves using the knowledge they had gained in the course in their work with their patients. They also encouraged the course organizers to continue offering the ODL course so that other students and other nursing schools might also benefit from the experience.

Finally, while a few students stated that some of the content had already been covered in their introductory nursing courses, others noted that their courses to date had not covered some aspects of the content in as much detail as they had encountered in the ODL course.

Table 1. Pretest and Posttest Means by Site

				95% Confidence Interval	
Site	Score	Mean	SE	Lower	Upper
Dominican Republic	Pretest	40.1	2.15	35.7	44.5
	Posttest	65.5	2.72	59.9	71.0
United States	Pretest	65.2	2.09	61.0	69.5
	Posttest	69.0	2.65	63.6	74.4
Overall	Pretest	51.7	2.61	46.4	56.9
	Posttest	67.3	1.89	63.4	71.1

Note: Time by site interaction was statistically significant ($p < .001$)

Table 2. Course Evaluation Responses

Evaluation Item	Neutral N (%)	Agree N (%)	Strongly Agree N (%)	Total Agree & Strongly Agree N (%)
My overall evaluation of the course is positive	2 (5.3)	3 (7.9)	33 (86.8)	36 (94.7)
I would recommend this course to a colleague	2 (5.3)	6 (15.8)	30 (78.9)	36 (94.7)
The course material is presented effectively	2 (5.3)	5 (13.2)	31 (81.6)	36 (94.8)
The case studies and thinking questions stimulate interest in the material	1 (2.6)	9 (23.7)	28 (73.7)	37 (97.4)
The material in the modules reflects the learning objectives of the course	1 (2.6)	6 (15.8)	31 (81.6)	37 (97.4)
This course has challenged me to think	2 (5.3)	7 (18.4)	29 (76.3)	36 (94.7)
The quizzes accurately assessed what I have learned in the course	0 (0)	12 (31.6)	26 (68.4)	38 (100)
The difficulty of the course was appropriate	1 (2.6)	10 (26.3)	27 (71.1)	37 (97.4)
The course material was relevant to my nursing practice	1 (2.6)	3 (7.9)	34 (89.5)	37 (97.4)
The material was culturally appropriate to me	1 (2.6)	7 (18.4)	30 (78.9)	37 (97.3)
I learned something new	0 (0)	6 (15.8)	32 (84.2)	38 (100)
I am confident that I can apply what I have learned to my nursing practice	0 (0)	7 (18.4)	31 (81.6)	38 (100)

Note: No participants selected response options of "Disagree" or "Strongly Disagree" for any item.

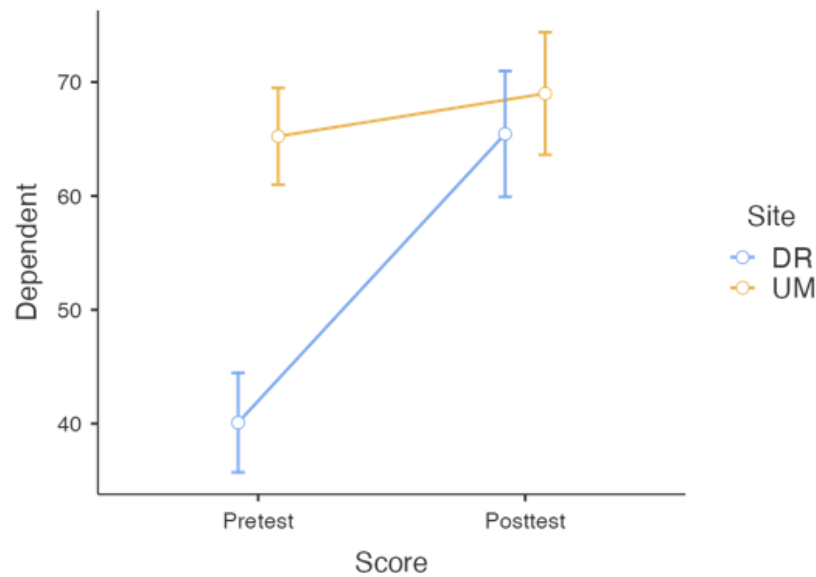


Figure 1. Average Score by Site Interaction

Discussion

This paper described an international collaboration between two schools of nursing – one in the United States and one in the Dominican Republic – to implement a nursing patient safety ODL course during the COVID-19 pandemic. Students received foundational training in patient safety concepts and practices, and learned about how the U.S. and D.R. health care systems were addressing pandemic-related patient safety concerns. The course also provided a platform for cross-cultural engagement, sharing and learning among students from the two countries.

We were especially encouraged by the students' extremely positive course evaluations. These evaluations affirm the potential of international partnerships and ODL modalities to promote cross-cultural learning and to strengthen nursing education worldwide. Structured ODL courses in particular can be especially useful when schools of nursing face pandemic-related shutdowns or other restrictions that make it difficult or impossible to conduct in-person classroom instruction. Significantly, most of the students reported that they had never participated in an international education program; this finding highlights the need for more international learning experiences that can help nursing students to expand their cultural knowledge and to develop the cultural competencies they will need in order to provide

appropriate nursing care to increasingly diverse patient populations.

Conclusion

Our experience in implementing a nursing patient safety ODL course can serve as a model for (1) how ODL can help nursing schools respond to restrictions imposed by an ongoing pandemic; (2) how ODL can be used to enhance cross-cultural nursing education; and (3) how nursing schools worldwide can implement effective international collaborations to strengthen and standardize nursing education. Through the promotion of international partnerships and ODL courses, schools of nursing can expand educational opportunities and research portfolios aimed at strengthening nursing education, increasing patient safety in clinical practice, developing cultural competencies, and improving global health outcomes.

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Ethical Clearance: This study was approved by the University of Miami Institutional Review Board (20190900).

Conflict of Interest: There is no Conflict of Interest to disclose.

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Pregnant women's Knowledge About Exercise During Pregnancy: Military Hospital-2022

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Abstract

Introduction: Exercise is a bodily activity that improves or maintains physical fitness and overall health and wellness exercise during pregnancy is important and can help with some common discomforts of pregnancy and even help prepare the pregnant women body for labor and delivery, (6)

Objective: To study the pregnant women knowledge¹ regarding exercise during pregnancy.

Methods This is a descriptive cross sectional hospital base study which was carried out in military hospital in Khartoum state - Sudan, the data were collected by structured questionnaire and analyzed using the statistical program for social sciences (SPSS) version 21 Convenient sampling technique was used and the samples were 70 pregnant women. The knowledge is categorized good (>60%), Moderate (50%-60%), poor (< 50%). A statistical significance was considered at p -value of < 0.05.

Result: The study revealed that the total mean knowledge about type of exercise was (95.7%), walking was the most common exercise among the study sample, 90.0 believe that exercise during pregnancy facilitates normal delivery, and vaginal bleeding was considered as contraindication among (84.3%). factors influencing exercise during pregnancy (31.4%) said fear from complication is one of the factors influencing exercise during pregnancy The overall knowledge of pregnant women about exercise during pregnancy was poor (36.3%).

Conclusion: Nursing education is the major tasks of nursing profession. The study concluded that there is insufficient knowledge of pregnant women about exercise during pregnancy 52 (74.3%). Followed by no relation between educational level, age and knowledge about type of exercise, regarding benefits and contraindications to exercise during pregnancy (p . value < 0.05). so the study recommended to conduct more researches to enhance in increasing mother's knowledge about exercise during pregnancy.

Key words: knowledge, pregnancy, exercise, lifestyle, Health effect, contraindications

Introduction

Physical activity, defined as any bodily movement produced by the contraction of skeletal

muscles in all stages of life, maintains and improves cardiorespiratory fitness, reduces the risk of obesity and associated comorbidities, and results in greater longevity. Women who begin their pregnancy with

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a healthy lifestyle (e.g., exercise, good nutrition, nonsmoking) should be encouraged to maintain those healthy habits. Women who do not have healthy lifestyles should be encouraged to view the pre-pregnancy period and pregnancy as opportunities to embrace healthier routines. Exercise defined as physical activity consisting of planned, structured, and repetitive bodily movements done to improve one or more components of physical fitness (1), is an essential element of a healthy lifestyle, and obstetrician-gynecologists and other obstetric care providers should encourage their patients to continue or to commence exercise as an important component of optimal health so it help in an improvement in cardiovascular and metabolic function, and increased strength and bone density. Regular exercise appears to lower the risk of gestational diabetes mellitus (GDM), gestational hypertension, and preeclampsia. (2),(Evidence also exists for the role of exercise in preventing incontinence during pregnancy and in the postpartum period (3).

As postulated by the American College of Obstetrics and Gynecology (ACOG) pregnant women achieve at least 150 min or more per week of moderate-intensity were labeled as physically active (PA). (4)

Furthermore, exercise duration, frequency and intensity can be prescribed on an individual basis to avoid potential hyperthermia. Although care needs to be taken when prescribing exercise, the benefits of being active during the prenatal period far outweigh the risks (3).

The factors influencing exercises during pregnancy include mothers have hard schedule, insufficient knowledge, fear from complication, husband disagreement and physical exercises during Pregnancy not common behavior. Encouraging exercise in women with an uncomplicated pregnancy should form an integral part of antenatal care to maintain a healthy life. The prenatal nurse monitors the health status of the mother and fetus, provides emotional support, and teaches the pregnant woman and her family about physiological and psychological changes during pregnancy, fetal development, labor and childbirth, and care for the newborn So, the purpose of this study to assess the pregnant women's knowledge about exercise during pregnancy.

Research Methods

A hospital -based cross-sectional study design was conducted in military hospital in Khartoum state - Sudan, the targeted population was pregnant women attained in ante natal clinic during the study. The sample included 70 pregnant women who were enrolled in the study, and they were selected by convenient sampling technique. The data were collected by researcher using a structured administered questionnaire to assess the knowledge of pregnant women regarding exercise during pregnancy. The data were analyzed using the Statistical Package of Social Science (SPSS), version 21 and a significance test was checked by chi-square test and the results were accepted when the p-value = 0.05 or less the result presented as cross tabulation and figure. An ethical approval was obtained from Al Farabi College for science and technology. Permission from the administrative authority of military hospital and Verbal consent was obtained from the participants after explaining the purpose of this study, confidently was kept.

Results

Table 1: Distribution of study sample according to advices receiving about exercise during pregnancy(n=70):

Advices	Frequency	Percent
Received	62	88.6%
Not received	8	11.4%
Total	70	100%

The majority of the participant (88.6%) received advice about exercise during pregnancy during antenatal follow-up.

Table 2: Distribution of study sample according to source of information about exercise during pregnancy(n=120):

Advice	Frequency	Percent
Physicians	23	32.9%
General doctor	15	21.4%
Medical assistant	8	11.4%
Midwife	12	17.1%
No answer	12	17.1%
Total	101	100%

Physicians and general doctor are the persons who instructed the pregnant women about exercise during pregnancy (47.5%), (30.7%) respectively and 17.1% received instruction from midwife.

Table 3: Distribution of study sample according to type, recommended level and benefits of exercise should be practiced during pregnancy. (n=70)

Variable	Yes		No	
	F	%	F	%
9/ type of exercise	67	95.7	3	4.3
1.Walking				
2.Swimming.	29	41.4	41	58.6
3.Cycling	11	15.7	59	84.3
4. Ankle, toe exercises	17	24.3	53	75.7
5. Abdominal strengthening exercises	10	14.3	60	85.7
6. Pelvic floor strengthening exercises	18	25.7	52	74.3
7. Back exercise	31	44.3	39	55.7
8. Breathing exercises	37	52.9	33	47.1
9. Relaxation exercises	45	64.3	25	35.7
10/ Recommended level and frequency of exercise	42	60.0	28	40.0
11. what is the benefit of exercise?	63	90.0	7	10.0
1. Facilitates normal delivery				
2. Reduces risk of back pain during pregnancy	38	54.3	32	45.7
3. Prevents excessive weight gain during pregnancy	34	48.6	36	51.4
4. Reduces risk of diabetes during pregnancy	16	22.9	54	77.1
5. Strengthens pelvic floor muscles during pregnancy	20	28.6	50	71.4
6. Reduces formation of varicose veins during pregnancy	18	25.7	52	74.3
7. Reduces of swelling of extremities during pregnancy	24	34.3	46	65.7
8. Increases muscle tone, strength, and endurance during pregnancy	23	32.9	47	67.1
9. Increased energy and power during pregnancy	20	28.6	50	71.4
10. Improvement of body awareness, posture, coordination, and balance during pregnancy	25	35.7	45	64.3
11. Give ability to cope with labor and delivery	25	35.7	45	64.3
Mean of knowledge	613	41.7	857	58.3

Mean 58.3 of the participant had insufficient knowledge about types, frequency and benefit of exercise most of participant said Walking is safe type (95.7%) and 90.0% said the benefit of exercise is Facilitates normal delivery

About the Recommended frequency of exercises during pregnancy, based on individual fitness level is moderate exercise of 30 min per day, two to three times a week during pregnancy more than half of the participant they knew.

Table 4: Distribution of study sample according to Contraindication, factors influencing exercises and type of exercise should be avoided during pregnancy, Other types of exercise(n=70)

Variable	Yes		No	
	F	%	F	%
12. Contraindication of exercise	59	84.3	11	15.7
(1) Vaginal bleeding during pregnancy				
(2) Uterine contractions during pregnancy	31	44.3	39	55.7
(3) Chest pain during pregnancy	27	38.6	43	61.4
(4) Migraine during pregnancy	18	25.7	52	74.3
(5) Difficulty in breathing during pregnancy	26	37.1	44	62.9
(6) Swelling of the extremities during pregnancy	20	28.6	50	71.4
(7) Back pain during pregnancy	18	25.7	52	74.3
(8) Extreme weight gain or loss during pregnancy	17	24.3	53	75.7
(9) Diabetes during pregnancy	20	28.6	50	71.4
13. factors influencing exercises during pregnancy	13	18.6	57	81.4
1. do not feel like exercising				
2. have busy schedule	16	22.9	54	77.1
3. Insufficient knowledge	5	7.1	65	92.9
4. fear from complication	22	31.4	48	68.6
5. Husband disagreement	3	4.3	67	95.7
6. physical exercises during Pregnancy does not suit our culture	12	17.1	58	82.9
14. type of exercise should be avoided during pregnancy?	20	28.6	50	71.4
1. Downhill Skiing				
2. Basketball,	21	30.0	49	70.0
3. horseback riding	15	21.4	55	78.6
4. jumping	42	60.0	28	40.0
5. Running	53	75.7	17	24.3
15. Other types of exercise	20	28.6	50	71.4
1. Dancing				
2. Playing tennis	16	22.9	54	77.1
Mean of knowledge	494	32.1	1046	67.9

Mean 67.9of the participant had moderate knowledge about contraindication, factors influencing exercises and type of exercise should be avoided, (31.4%) they said fear from complication is one of the factors influencing exercise during pregnancy and 84.3% said Vaginal bleeding during pregnancy is one of contra indication 75.7%said Running is the main types of exercise should be avoided during pregnancy.

Table 5: Frequency distribution of the sample according to overall knowledge level about exercise during pregnancy (n=70)

	Frequency	Percent ^o
Poor	52	74.3%
Moderate	15	21.4%
Good	3	4.3%
Total	70	100.0

Most of the participants had poor knowledge about exercise during pregnancy 74.3%

Table 6: Association between knowledge about exercise during pregnancy and age : (n=70)

			Knowledge			Total	P value
			good	Moderate	poor		
Age	<18 years	Count	13	3	0	16	.466
		% of Total	18.6%	4.3%	0.0%	22.9%	
	18-30 years	Count	31	7	2	40	
		% of Total	44.3%	10.0%	2.9%	57.1%	
	31-40 years	Count	6	5	1	12	
		% of Total	8.6%	7.1%	1.4%	17.1%	
	>40 years	Count	2	0	0	2	
		% of Total	2.9%	0.0%	0.0%	2.9%	
Total	Count	52	15	3	70		
	% of Total	74.3%	21.4%	4.3%	100.0%		

There is no significant association between pregnancy p value .466 it higher than significance education level and knowledge of exercise during pregnancy level (P. value < 0.05) .

Table 7: Association between knowledge about exercise during pregnancy and education level: (n=70)

			Knowledge			Total	P value
			good	Moderate	poor		
Educational level	illiterate	Count	3	3	0	6	.771
		% of Total	4.3%	4.3%	0.0%	8.6%	
	primary	Count	16	5	1	22	
		% of Total	22.9%	7.1%	1.4%	31.4%	
	secondary	Count	22	5	2	29	
		% of Total	31.4%	7.1%	2.9%	41.4%	
	graduate	Count	10	2	0	12	
		% of Total	14.3%	2.9%	0.0%	17.1%	
	post graduate	Count	1	0	0	1	

There is no significant association between education level and knowledge of exercise during pregnancy p value .771 it higher than significance level (P. value < 0.05) .

Discussion

This study aimed to assess the pregnant women knowledge regarding exercise during pregnancy. Conducted in Military hospital the population is 70 pregnant women. Majority of the study participants were aged between (18 - 30) years old, this age known as reproductive age this finding is similar to a study conducted in India by D.R Alamurugan Sujindra which show that range of the study group was 35-18 years with a mean age of 4.51+25 years. Concerning

educational level most of the study participant had secondary education 41.4%, on the other hand there is no significant association between educational level and knowledge of mothers about exercise during pregnancy P. value 0.771 this result disagree with study done in India which revealed that majority of the study population had undergone primary education 63%. Most of the study participants were housewife this result agrees with study conducted in India by Dr.Elamurugan Sujindra, the percentage had undergone primary education and were homemakers. %74. Regarding information about exercise during pregnancy majority of the study participant (88.6%) get information about exercise. 32.9% of pregnant women her get instruction from

physiologist .27.4% general doctor. 17.1% of midwife. 11.4% of medical assistant. This result is not similar to study conducted by Penny Clark, Harriet Gross BA Fifty - five respondents) %96(indicated that they had received advice about physical activity at least once during pregnancy. Regarding knowledge about type of exercise which should be practiced during pregnancy, majority of study participant mentioned walking this result is logical because walking is safest and most productive activities during pregnancy by evidence the result of this study similar to study conducted in Ethiopian which showed that the prevalence of practice to pregnant women about exercise 90.7% doing walking and about 38.9% doing relaxation, 36.1% is doing Breathing exercise and pelvic floor about 5.6% of pregnant women, 2.8% doing yoga, On the other hand the mean 58.3 of participants knowledge about type of exercise were moderate. where few of 29 our participant knew about the different type of exercises like, 64.3% relaxation exercise and 52.9% doing Breathing exercise, pelvic floor 25.7% this finding disagree with study conducted in Saudi about types and amount of physical activity. This revealed that Less than half of the women were either walking (26%) or exercising (42%) adequately (i.e.-150 min/week). More than half of pregnant women (60.0%) know about frequency of exercise during pregnancy recommended level and frequency of exercise, based on individual fitness which is 30 minutes per day, two to three times a week during pregnancy as set out by ACOG guideline 2002. Considering the knowledge of respondents on the benefit of exercise during pregnancy, majority of pregnant women believe that it facilitates normal delivery, this result is disagreeing with study conducted by made 2014 in Nigeria which show a majority of Nigerian pregnant women demonstrated inadequate knowledge but had positive attitude towards antenatal exercise. Knowledge about benefits and contraindications to antenatal exercise significantly influenced the attitude towards exercise in pregnancy. The mean knowledge about contraindications of exercise during pregnancy in this study was moderate and the participants only mentioned vaginal bleeding as contraindication and other pregnant women knew the other contraindication of exercise during pregnancy such as uterine contractions, chest pain,

back pain, migraine and difficulty in breathing, This finding is similar to study done by (Mbada) in Nigeria The study show that majority of Nigerian pregnant women demonstrated inadequate knowledge but had positive attitude towards antenatal exercise. Knowledge about benefits and contraindications to antenatal exercise significantly influenced the attitude towards exercise in pregnancy .some of pregnant women said that fear from complication is one of the factors influencing exercise during pregnancy this finding reliable with study conducted in Nigeria by(Mbada) majority of the participant were know about exercise that should be avoided during pregnancy 75.7% said Running is the main types of exercise should be avoided during pregnancy because of aggravating of complication . And when ask about other types of exercise like (Dancing, playing tennis) the majority of sample about 28.6% of women know about it, playing tennis 22.9%. respectively.³⁰ From here, the study reported that overall knowledge of pregnant women about exercise during pregnancy was poor (74.3). This finding is disagree with study conducted in Saudi which revealed that 349 pregnant women, 193(55.3%) had adequate knowledge, a positive attitude, and good practice respectively also this result is similar to study conducted in America to assess knowledge, attitude, and practice of exercise during pregnancy among antenatal mothers, This study is helpful to nursing profession to teach women during pregnancy about the importance of exercise and shows the knowledge of women on exercise during pregnancy was less than average, and their attitude was favorable. However, a very few were actually practicing exercise in pregnancy.

Conclusion

The findings of this study suggest that pregnant women knowledge concerning exercise during pregnancy was poor about 52 (74.3%) and there was no significant association between age, level of education and knowledge of exercise during pregnancy.

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The Impact of Collaborative Testing on Teamwork and Collaboration in Nursing Students

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Abstract

Teamwork and collaboration are inherent to the work of a nurse. In a post-pandemic nursing education world, students need more opportunities to collaborate and work as a team.

Clinical and classroom strategies in nursing education are often group-based to help support development of teamwork and collaboration skills. Testing is often omitted from being group-based but could be included as a strategy to increase teamwork and collaborative skills. The purpose of this study was to examine the effect of collaborative testing on teamwork and collaboration in nursing students. Post-implementation survey results provided support for the continued use of collaborative testing as the overall outcomes were positive.

Keywords: collaborative testing, nursing education, testing

Introduction and Background

Teamwork and collaboration are essential to professional nursing. Practicing nurses and nurse educators are keenly aware of this, but it is even more solidified by the fact that national organizations such as the Quality and Safety Education for Nurses Institute (QSEN) identifies them as key competencies to providing safe patient care. During the coronavirus pandemic of academic year 2020-2021, students in nursing programs across the United States were at a disadvantage for spending time in collaborative groups and teams. Many nursing students were not allowed access to clinical settings, and most were not permitted to spend very much time on campus in groups, severely limiting in-person interactions, teamwork, and collaborative events. While nurse educators evolved quickly in their proficiency

at teaching remotely, barriers to providing effective collaborative opportunities in the remote environment were obvious. These include lack of student interaction, student and faculty fatigue with the online learning environment and lack of reliable internet access in many areas. In addition, many nursing programs have seen a decrease in program completion rates as students struggled to adapt to the remote learning environment.

As we come out of a world pandemic and move toward unhindered nursing education, the need to increase teamwork and collaborative opportunities will be paramount and critical to improved clinical outcomes. One method for sincere consideration is the implementation of collaborative testing. This type of testing has been studied for more than a decade and shown to positively affect problem-solving and

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communication skills as well as enhance group process skills^{1,2}. Eastridge & Benson³ found that collaborative testing decreased students' anxiety related to learning statistics when group-first testing was implemented. Long-term knowledge retention has also been reported to be an advantage of collaborative testing⁴. Examinations and testing in nursing education are most often used for the sole purpose of grade calculation; however, the testing process could also impact teamwork and collaboration skills. Allowing students to build on their previous knowledge of content while collaborating with peers to develop new ideas or concepts can create deeper learning as purported by the constructivist learning theory. A constructivist theoretical design is useful in giving learners opportunities to discuss and collaborate with learners of varying perspectives and experiences⁵. The purpose of this study was to examine the effect of collaborative testing on teamwork and collaboration in nursing students.

Method

The study was conducted at a public, 4-year university in the rural southeastern U.S. The university's institutional review board granted approval for the study. The convenience sample consisted of first and second-year nursing students in mental health nursing and fundamentals courses in a baccalaureate nursing program. The sample was 91% female, 9% male and predominantly white (94%). Students completed a minimum of three unit examinations applying the collaborative testing intervention. Students were divided into random groups consisting of three to four students per group for collaborative testing. After students complete the regular exam, they were not allowed to exit the room. Once all students were finished with individual exams, the groups completed the exam as a team. Additional points based on the group score were added to each individual member's exam score. Students participated in the collaborative testing as part of the courses. The survey about the experience was voluntary at the conclusion of the semester. After informed consent was obtained, participants completed the Student Evaluation of Collaborative Testing survey. The self-report instrument was adapted from the questionnaire

used by Cortright et al⁶ and adapted with permission to contain 18 Likert-style items.

Results

Participants were asked to rate the items on the following scale: 1=strongly disagree; 2=tend to disagree; 3=neither agree nor disagree; 4=tend to agree; 5=strongly agree. Means for survey items ranged from 1.34 to 4.91 for the n=32 participants. The lowest scoring items reflected participants' feelings about the ease of which others could be convinced about the correct answers (item 7, mean=2.69) and the fact they did not study less for the exams because of the collaborative test (item 13, mean=1.34). Several items (2, 3, 6, 11, 17, 18) with a mean of 4.81 or greater indicated participants appreciated the immediate feedback offered by the collaborative tests, the opportunity to collaborate with peers and more opportunity to critical think through the exam questions. Additionally, participants' scores indicated the collaborative tests help increase previous knowledge, improve understanding of material, and facilitated deeper learning by filling in knowledge gaps. The overall highest scoring item (15, mean=4.91) supported inclusion of the collaborative test process in other courses and content areas. Survey items and results are illustrated in Table 1.

Discussion

A limitation of this study was the small, convenient sample which limits generalizability of the results; however, the positive survey results from this study sample support the overall benefits of collaborative testing. Nursing is a collaborative profession and is constantly evolving in today's healthcare world. There are rare work shifts in clinical practice when a nurse does not consult with her nurse colleagues or other members of the interdisciplinary healthcare team regarding patient care and procedures/processes. Based on the collaborative nature of the profession, nurse educators should implement learning projects and utilize methodologies conducive for students to collaborate, practice teamwork, and deepen the students' understanding of content, not excluding the testing experience.

Table 1: Student Evaluation of Collaborative Testing Results

Survey Item	Mean
Collaborative testing increased my confidence.	4.65
Collaborative testing allowed me to increase my previous level of knowledge.	4.84
Collaborative testing facilitated my learning of the material.	4.81
Every collaborative member “pulled their weight” (contributed to the learning process).	4.59
The level of discussion during collaborative testing was high.	4.63
I appreciated the immediate feedback afforded by collaborative testing.	4.81
It was difficult to convince students of correct answers.	2.69
Collaborative testing enhanced my understanding and ability to synthesize and integrate material.	4.75
Collaborative testing provided a more positive relationship among students.	4.56
Collaborative testing provided a more positive relationship between students and faculty.	4.56
Collaborative testing provided the opportunity to discuss incorrect answers and fill in knowledge gaps and therefore improve understanding of the material.	4.81
My level of involvement during the discussions was high.	4.66
I studied less than normal for the exam because I knew I would have a collaborative test.	1.34
The collaborative test process allowed me to feel like I was part of a team.	4.50
I would recommend this process for other content areas.	4.91
Teamwork behaviors were apparent among the group members during the collaborative test.	4.69
I enjoyed the opportunity to collaborate with my peers.	4.88
Collaborative testing provided more opportunity for me to critically think through the test questions.	4.84

Implications

Duplication of this study with larger student cohorts in different subject areas is recommended. Exploring other areas of potential impact such as long-term knowledge retention would also be beneficial to support the use of collaborative testing in nursing education. Creating student test groups in the classroom based on personality characteristics, emotional intelligence quotient and academic ability would also provide interesting feedback on team dynamics. Further exploration of collaborative testing will further expand the body of knowledge on this unique learning strategy.

Conflict of Interest: Nil

Ethical Clearance: This project was approved by the Institutional Review Board of the University of Tennessee at Martin, IRB #2021-858-E05-4052/Radf,Mar

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An Experimental study: Effectiveness of Nursing protocol on postoperative outcome among patients undergoing major Visceral Surgeries in a Selected Tertiary Care Hospital at Delhi

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Abstract

Introduction : Surgery is almost always viewed as a life crisis and evokes anxiety and fear . In line with the growing number of surgical procedures being performed worldwide, postoperative complications are also increasing, proportionately increasing mortality, impairing patients' postoperative outcome, lengthening intensive care and total hospital stay. Preoperative assessment and care is extremely important prior to any invasive procedure including minor and major surgical procedures. Physical and psychological preparation tends to improve surgical outcomes. Preoperative teaching provides with pertinent information concerning the surgical process and the intended surgical procedure as well as anticipated patient behavior (anxiety, fear), expected sensation, and the probable outcomes. The experimental study was conducted to assess the effectiveness of nursing protocol on postoperative outcome among patients undergoing major visceral surgeries in a selected tertiary care hospital. The objectives of the study were to assess the post operative outcome of patients undergoing major visceral surgeries in the study and control group, to determine the effectiveness of nursing protocol on postoperative outcome among patients undergoing major visceral surgeries and to associate the post operative outcome with the socio demographic variables.

Materials and Methods: An experimental, post-test only design was used to conduct the study at tertiary care hospital in Delhi. The intervention was carried out in the pre-operative surgical wards of the tertiary care hospital and post-operative data was collected in the inpatient surgical unit. 63 samples in the experimental group and 63 samples in the control group were selected by simple random sampling technique. The study revealed that there was a significant difference in the pain scores on the seventh day after surgery and on the patient satisfaction related to preoperative education and intraoperative care.

Keywords: Preoperative education, Postoperative, visceral surgery, nursing protocol, postoperative outcome

Introduction

Surgery is almost always viewed as life crisis and evokes anxiety and fear.¹ In line with the growing number of surgical procedures being performed

worldwide, postoperative complications are also increasing proportionately increasing mortality, impairing patients' postoperative outcome, lengthening intensive care unit and total hospital stay.³ Preoperative assessment and care is extremely

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important prior to any invasive procedure including minor and major surgical procedures and physical and psychological preparation tends to improve surgical outcomes¹

Preoperative teaching provides with pertinent information concerning the surgical process and the intended surgical procedure as well as anticipated patient behaviour (anxiety, fear), expected sensation, and the probable outcomes.⁴ Relevant information, skills training, and psychological support are essential components of the pre-operative patient education.⁵ Few experimental or quasi experimental research studies have explored the impact of preoperative instruction in patients undergoing abdominal surgery. Evidence of the effect of preoperative education among surgery patients is inconclusive.

The present experimental study was conducted to assess the effectiveness of nursing protocol on postoperative outcome among patients undergoing major visceral surgeries in a selected tertiary care hospital with the following objectives.

1. To assess the post operative outcome of patients undergoing major visceral surgeries in the study and control group.
2. To determine the effectiveness of nursing protocol on postoperative outcome among patients undergoing major visceral surgeries.
3. To associate the post operative outcome with their selected demographic variables.

To answer the research question, the following hypotheses were formulated:

H_0 . There is no significant difference in post operative outcomes of patients undergoing major visceral surgeries in intervention group compared to control group.

The conceptual framework of the present study is developed by the investigator based on Imogene King's Goal Attainment Theory. Imogene King emphasizes the nurse's role as a process of action, reaction and interaction.

Here a nurse and the patients share information about the nursing situation and the process of human interaction begins between them. Each of them perceives the situation and through communication

they set goals, explore and agree to the means to achieve them.

Materials and Methods

The research design selected for the present study is **experimental post-test design** and the study was carried out from Sep 2020 to Aug 2021. The nursing protocol i.e. the intervention related to deep breathing and coughing exercises, use of incentive spirometer, pain management moving out of bed, early ambulation etc were taught with the help of video and demonstration in the pre-operative surgical wards of the hospital and ensuring that the patients practised the exercises taught every four hourly during waking hours on the first three days after surgery. Post-operative data was collected in the inpatient surgical unit in the same hospital. The samples in this study are patients undergoing visceral surgery in a tertiary care setting at Delhi. 63 samples in the experimental group and 63 samples in the control group were selected by simple random sampling technique. A pilot study was conducted on 10% of the samples. The pilot study showed feasibility in conducting the study. A few modifications were included in the study tool with expert's suggestions. The tool used for the study consists of two parts. The first part is related to the socio demographic data. The second part is to measure the post operative outcomes like morbidity, pain, patient satisfaction and postoperative mortality within 30 days after the index operation. Post operative morbidity was evaluated using Clavein Dindo classification. Numeric pain score was used for assessing the pain on the 2nd and 7th day after surgery. Patient satisfaction was assessed using a structured questionnaire on the third post operative day. The investigator adhered to the ethical principles of human rights, beneficence and non-maleficence, dignity, confidentiality and justice in all the aspects.

Results and Discussion

SPSS statistical package 20.0 was utilized for the data analysis.

Description of Demographic variables; The demographic variables of the samples undergoing major visceral surgeries were analyzed by using the frequency, percentage distribution, mean and standard deviation.

Table 1: Description of sample characteristics in terms of frequency and percentage

Demographic Variable		Experimental Group		Control Group		Chi-Square (p valve)
		F	%	f	%	
Age in Years	18-27	-	-	01	2	34.85 (0.09)
	28-37	07	11	05	8	
	38-47	16	25	15	24	
	48-57	14	22	17	27	
	58-67	11	18	16	25	
	68-77	11	18	09	14	
	78-87	04	6	-	-	
	Above 87	-	-	-	-	
Gender	Male	33	52	36	57	8.25 (0.14)
	Female	30	48	27	43	
Marital Status	Unmarried	06	10	08	13	8.32 (0.004)
	Married	57	90	55	87	
Religion	Hindu	48	76	49	78	3.75 (0.710)
	Sikh	-	-	02	3	
	Christian	08	13	07	11	
	Muslim	07	11	05	8	
	Others	-	-	-	-	
Education	Less than 10	17	27	26	41	22.61 (0.007)
	10-12	17	27	11	17	
	Graduate	20	32	16	26	
	Post-graduate	09	14	10	16	
	Others	-	-	-	-	
Income	Less than 10,000	-	-	-	-	5.364 (0.498)
	10,000-30,000	15	24	25	40	
	30,001-60,000	37	59	32	50	
	60,001-90,000	09	14	06	10	
	90,001-1,20,000	02	3	-	-	
	More than 1,20,000	-	-	-	-	
Dietary Pattern	Veg	25	40	24	38	3.16 (0.78)
	Non-Veg	13	20	13	21	
	Mixed	25	40	26	41	

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Surgery	Hernia	17	27	12	19	38.25 (0.636)
	Cholelithiasis	13	21	15	24	
	CA Pancreas/ CA Gall Bladder	11	17	08	13	
	Renal Calculus	05	8	04	6	
	Periampullary CA/ CA Stomach	04	6	04	6	
	CA Colon	08	13	06	10	
	Renal Transplant	-	-	04	6	
	EXP LAP	05	8	10	16	
Co-morbidities	Nil	19	31	21	33	56.13 (0.470)
	Diabetes Mellitus	09	14	09	14	
	Hypertension	11	17	08	13	
	Cardiac	07	11	05	8	
	Thyroid	02	3	04	6	
	Diabetes Mellitus + Hypertension	05	8	02	3	
	Diabetes Mellitus + Hypertension + Thyroid	03	5	06	10	
	Diabetes Mellitus +Cardiac + Hypertension	07	11	05	8	
	Cardiac Hypertension + Thyroid	-	-	-	-	
Others	-	-	03	5		
ASA Grading	I	31	49	18	29	4.675 (0.322)
	II	23	37	29	46	
	III	09	14	16	25	

Analysis revealed that in the experimental group, majority of the participants i.e. 25% belonged to age group 38-47 years, 52% of the participants were male and 48% were female, 90% were married. 76% were Hindus, 32% of the participants were Graduates, 59% belonged to 30,001-60,000 income group, 40% were having non-veg & mixed dietary pattern, 27% of the participants were admitted for hernia surgery followed by cholelithiasis surgery 21% , 31% were having no co-morbidities, 49% of the participants were in ASA grading I.

In control group, majority i.e 27% of the participants were in the age group 48-57 years, 57% were male and 43% were female, 87% of the participants were married, 78% of the participants were Hindus, 41% of the participants educational

status were less than 10 th standard, 50% of the participants belonged to 30,001-60,000 income group, 41% of the participants were having mixed dietary pattern, 24% of the participants underwent cholelithiasis surgery followed by Hernia surgery i.e. 19%, 33% were having no co-morbidities, 46% of the participants were in ASA grading I & II.

Effectiveness of nursing protocol on postoperative outcomes

In the experimental group, the majority, i.e., 98% of the participants were not having post-operative morbidity and 2% of the participants were having pneumonia on the 2nd day after surgery. On the 7th day 98% of the participants were not having post-operative morbidity and 2% of the participants were

having pneumonia. On the 30th day no samples had post-operative morbidity.

In the control group, 92% of the participants were not having **post-operative morbidity** and 8% of the participants were having pneumonia on **2nd day** post operatively. **On the 7th day** 92% of the participants were not having post-operative morbidity and only 8% of the participants were having pneumonia. On 30th day after surgery none of the participants were having post-operative morbidity

When the **pain scores** were assessed using the numeric pain score on the **2nd post operative day** it was found that 68% samples of the control group and 65% samples of the experimental group experienced severe pain and 32% participants of the control group and 35% participants of the intervention group had moderate pain.

When the **pain scores** were analyzed using numeric pain score on the **seventh post operative day** it was found that 80% in the control group (standard education group) and 97% in the interventional group had only mild pain and 20% in the control group (standard education group) and 3% in the interventional group experienced moderate pain and none had severe pain The mean post-test post-operative pain score on 7th day (2.38 ± 0.68) of the experimental group was lower than the mean post-test post-operative pain score (3.11 ± 0.91) of the control group with the mean difference of 0.23.

The calculated t value ($t=5.067$) was more than the tabled value ($t_{124} = 1.65$). Hence there is statistical significance difference in the mean post-test post-operative pain score.

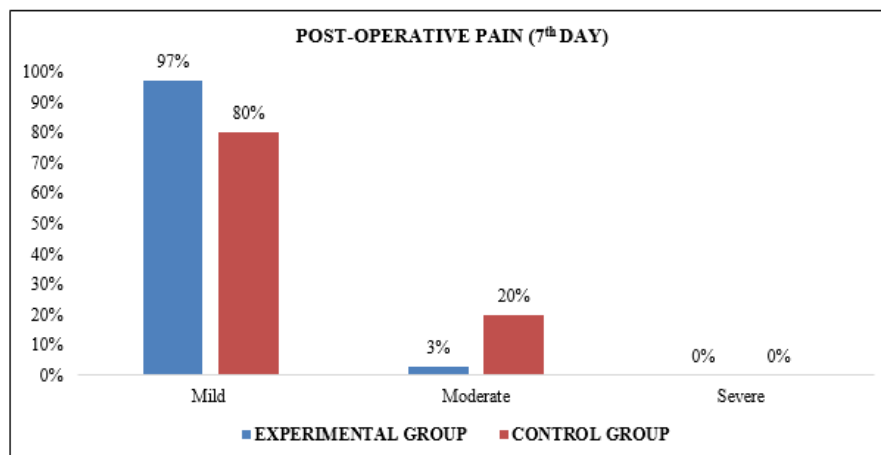


Fig 1: Comparison Of Post-Operative Pain In Exptl And Control Gp On 7th Day After Surgery

In a study conducted by Salah FathiAlhj Taher, it was shown that educational intervention patients reported reduced pain scores at various events in the post-operative period after implementing the self-management techniques discussed during preoperative counseling. The study discovered that preoperative education serves a significant influence in reducing preoperative anxiety in patients undergoing abdominal surgery, minimizing postoperative discomfort, and influencing vital signs. This study suggests that preoperative health education should be an integral part of normal care for surgery patients' preoperative preparations.

On analyzing the patient satisfaction in relation to intraoperative care and preoperative education the mean post-test patient satisfaction score (12.58 ± 1.07) of the experimental group was higher than the mean post-test patient satisfaction score (11.79 ± 1.50) of the control group with the mean difference of 0.79. The calculated t value was ($t=3.40$) more than the tabled value ($t_{124} = 1.65$). Hence there is statistical significance difference in the mean post-test patient satisfaction score to intraoperative care and patient education among patients undergoing visceral surgeries.

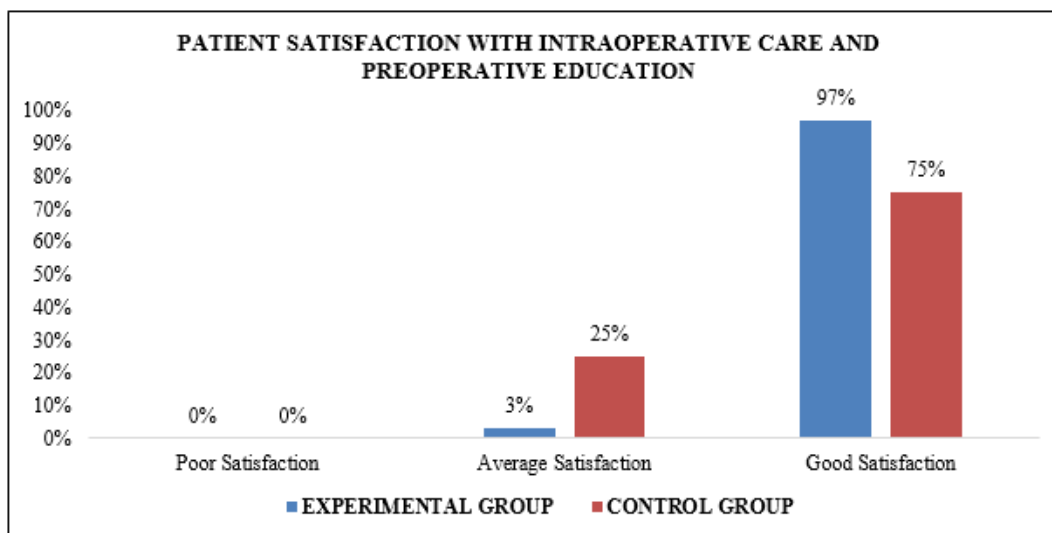


Fig 2: Patient Satisfaction With Intraoperative Care And Preoperative Education

It was similar to studies by Kalogianni, A et al. (2019) that explored the effect of preoperative education on satisfaction and postoperative outcomes of patients undergoing heart surgery. Scores on all measures of satisfaction were higher for the intervention group ($p < 0.001$).¹³

When the mortality of the patients undergoing major visceral surgery was analyzed in the experimental group and control group till the 30th day of surgery it was observed that no mortality was there in the control group and in the experimental group.

Association of postoperative outcomes with socio demographic variables

In this experimental research the association of the selected demographic variables with post-operative morbidity on 2nd day, 7th day and 30th day in the experimental group according to Clavien Dindo Classification revealed that there is no significant association established with the selected socio-demographic variables. In case of control group also with post-operative morbidity on the 2nd day, 7th day, 30th day according to Clavien Dindo Classification, the analysis revealed that there is no significant association established with the selected socio-demographic variables.

Further the association of the selected demographic variables with post-operative pain 2nd day and 7th day in the experiment group according to Numerical Rating Pain Scale revealed that there is no significant

association established with the selected socio-demographic variables. Also in control group with post-operative pain on 2nd day, and 7th day according to Numerical Rating Pain Scale the analysis revealed that there is no significant association established with the selected socio-demographic variables.

The analysis of patient satisfaction in the control group with preoperative education and intraoperative care revealed that there is no significant association established with the selected socio-demographic variables.

Conclusion

Postoperative complications burden not only the individual patient but also the healthcare system and the nation's economy at large. It is estimated that postoperative complications account for 22% of preventable deaths among hospitalized patients, 2.4 million hospital days and 9.3 billion in hospital charges as a result of complications annually.

Patient education is a crucial component of the job of medical professionals and inpatient care. The purpose of patient education is to develop patients' competence, confidence, and self-efficacy and empower them to participate actively in their care, thereby decreasing postoperative complications and mortality.

Ethical clearance taken from Bareilly International University ethical committee and tertiary care hospital at Delhi.

Informed consent was taken from the participants of the study.

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Conflict of Interest: Nil

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Nurse Administrators' Roles for Nurse Retention when Radioactive Disaster occurs: Findings from Nurses' Evacuation Consideration and Evacuation after the Fukushima Daiichi Nuclear Power Plant accident

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Abstract

Background: In 2011, a nuclear accident severely affected many hospitals in Fukushima. Many nurses faced a dilemma of whether to evacuate voluntarily or keep working. This study examined the voluntary evacuation and returning of nurses and then suggested how nurse administrators can prepare for such situations.

Methods: The study was conducted from July through September 2018. Eight hundred nurses who had been working prior to the incident in three hospitals in Koriyama and Aizuwakamatsu participated. Although both cities had higher-than-normal terrestrial radiation levels, Koriyama's level was three times higher. An anonymous questionnaire was administered, and individual interviews were conducted with participants. For statistical analyses, SPSS Statistics for Windows, version 25.0, was used.

Results: Ultimately, 723 questionnaires were collected. The proportions of those who considered evacuating (33.1%) and who evacuated (8.1%) were significantly higher in Koriyama. The characteristics of the group who considered evacuation were being pregnant, living with an adult cohabitant, and/or living with small child (ren). The evacuated nurses were all female and had similar characteristics as the group that considered evacuating; however, the age of their children was not related. Four out of six interviewees contacted nurse administrators and/or colleagues and overcame their feelings of guilt when their superiors and colleagues welcomed them back to work.

Conclusion: Nurse administrators should understand that, when a radioactive disaster occurs, individuals who are more likely to consider evacuation have conflicts between their personal life and professional responsibilities. Nursing departments should inform nurses of their policies in advance and respect individuals' decision to leave, supporting them when they return to work. Departments should also have a plan in place for managing with a temporarily reduced workforce.

Introduction

Nurses comprise the largest healthcare workforce and their turnover leads to a shortage in

the clinical workforce; consequently, management of nurse retention has been studied in many countries¹⁻⁴. When large-scale disasters occur, such

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nurse shortages are more problematic. In 2011 the Great East Japan Earthquake (GEJE) affected many hospitals in three prefectures: Iwate, Miyagi, and Fukushima. The Fukushima Daiichi Nuclear Power Plant (FDNPP) accident brought more severe damage to hospitals not only in the coastal area near the plant, but also in inland areas. Maehara⁵ reported that, in the 44 hospitals in Fukushima, 5.2% of staff left the workplace immediately after the accident due to fear of radiation exposure.

FDNPP affected mostly coastal areas; however, inland areas also had much higher-than-normal terrestrial radiation levels and accepted many evacuated patients from coastal areas. In 2013, Sato et al.⁶ reported that 44.6% of nurses at the inland Fukushima Medical University Hospital, 63 km northwest of FDNPP, intended to leave after the accident. The first researcher was working for an inland general hospital in Koriyama City (Koriyama); some colleagues who evacuated voluntarily resigned while others returned to their wards afterward. Ota⁷ who worked at a hospital on the coast described hospital staff's evacuation dilemma.

Nurse administrators must understand nurses' situation to maximize nurse retention. Suggestions for maintaining staff retention include strengthening the hospital's business continuity plan (PCB) to provide the necessary health services to community members when disasters occur.

This study aimed to understand nurses' voluntary evacuation and return in order to suggest ways nurse administrators can prepare for radiation disasters to support both evacuated nurses willing to return and nurses who remain. The researchers considered nurses in two areas: Koriyama, 58 km west of FDNPP, which had the highest terrestrial radiation (8.26 microsievert per hour [$\mu\text{S}/\text{h}$]) three days after the accident and faced electricity, water, and logistics shortages⁸, and Aizuwakamatsu (Aizu), 98 km west, which had 2.57 $\mu\text{S}/\text{h}$ three days after the accident and faced logistics challenges⁸. Both cities' regular terrestrial radiation level was approximately 0.5–0.7 $\mu\text{S}/\text{h}$ ⁸.

Method

Target population: Eight hundred nurses who were working prior to the FDNPP incident in three

general hospitals in Koriyama (500 nurses) and Aizu (300 nurses) each.

Questionnaire: An anonymous questionnaire was developed to understand nurses' personal attributes, nursing position, family structure, presence or absence of pregnancy, intention to leave the workplace, voluntary evacuation/reasons for evacuating or not, conditions of contact with nurse administrators during evacuation and return, at the time of the accident. These items were selected based on Sato's article⁶ and Toho Area Research Institute's report⁹. They were informed to submit the anonymous questionnaire if they agreed to participate. The questionnaires with envelopes were delivered to nursing department directors in six hospitals; boxes to collect the sealed envelopes were set up during the study period.

Interview: The researchers asked nursing directors to recommend nurses who had voluntarily evacuated and then returned to the workplace. Only nurses who agreed to an individual interview with the researcher and signed the informed consent participated. Interviews focused on how and who decided about evacuation, contacts with nursing administrators and colleagues during evacuation, and decisions to return to workplaces.

Study period: July 17 through September 28, 2018.

Data analysis: Microsoft Excel, for Mac version 16.18.2018 (Washington, USA), was used for the simple calculations of numbers and percentages. For some statistical analyses, SPSS Statistics for Windows, version 25.0 (IBM Corp., NY, USA), was used. To test the normal distribution of age, the Kolmogorov-Smirnov test was used and the Mann-Whitney's U test was applied to test differences between age distributions in two cities. To determine the proportion difference between two cities and within Koriyama, a chi-square test or multiple comparison test with Bonferroni correction was applied. For all tests, a *p*-value of less than .05 was applied.

Results

1. Response number and rate

Koriyama nurses returned 460 questionnaires (92.0%); Aizu nurses returned 264 questionnaires

(90.5%). One questionnaire from Koriyama with incomplete responses was removed, resulting in 723 responses for analysis (valid response rate: 90.4%).

2. Participants' personal attributes

Table 1 summarizes participants' age, gender,

position, and pregnancy condition. The only difference between the two cities was age distribution; Koriyama's nurses were significantly younger than Aizu's.

Table 1. Comparison of nurses' personal attributes between two cities

Category	Sub-category	Koriyama	Aizu	<i>p</i> -value
Age*	Median (range)	33.0 (20-60)	40.0 (21-62)	<0.001
Gender**	Female	421 (91.7%)	251 (95.1%)	0.142
	Male	35 (7.6%)	12 (4.5%)	
Position**	Staff	370 (81.5%)	214 (82.0%)	0.949
	Administrator	84 (18.5%)	47 (18.0%)	
Pregnancy**	Presence	31 (7.7%)	11 (5.4%)	0.368
	Absence	372 (92.3%)	194 (94.6%)	

*: Mann-Whitney's U test

**: Pearson's chi-square test

3. Nurses considering evacuation

Of the 723 participants, 33.1% of Koriyama nurses considered voluntary evacuation, which was significantly higher than in Aizu (Table 2).

Table 2. Comparison of nurses who considered voluntary evacuation in two cities

Category	Koriyama	Aizu	<i>p</i> -value
Considered	152 (33.1%)	424 (9.1%)	<0.001
Not considered	307 (66.9%)	240 (90.9%)	

*Pearson's chi-square test

The reasons for considering evacuation were the same in both cities: fears about their children's health, fears about their own health, and family members' suggestion to evacuate. Among nurses with no children, fears about their own health ranked first. Meanwhile, the reasons for not evacuating differed in the two cities. The majority of Koriyama nurses answered "responsibilities as nurses" while those in Aizu indicated the "low terrestrial radiation level."

Table 3 compares nurses in the two cities who considered voluntary evacuation based on gender, position, pregnancy condition, and having child (ren). All females—whether nurses/nurse administrators, pregnant/not pregnant, and having child (ren)/having no child—had higher proportions in Koriyama than Aizu. Males showed no differences.

Table 3. Comparisons of nurses who considered voluntary evacuation in two areas

Category	Subcategory		Koriyama	Aizu	<i>p</i> -value
Female*		Considered	139 (33.0%)	22 (8.8%)	<0.001
		Not considered	282 (67.0%)	229 (91.2%)	
Male**		Considered	13 (37.1%)	2 (16.7%)	0.288
		Not considered	22 (62.9%)	10 (83.3%)	
Staff nurse*		Considered	130 (35.1%)	22 (10.3%)	<0.001
		Not considered	240 (63.9%)	192 (89.7%)	

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Nurse administrator*		Considered	20 (23.8%)	1 (2.1%)	0.001
		Not considered	64 (76.2%)	46 (97.9%)	
Pregnancy	presence**	Considered	20 (64.5%)	2 (18.2%)	0.013
		Not considered	11 (35.5%)	9 (81.8%)	
	absence*	Considered	115 (30.9%)	12 (6.2%)	<0.001
		Not considered	257 (69.1%)	182 (93.8%)	
Child(ren)	presence*	Considered	97 (46.0%)	19 (10.9%)	<0.001
		Not considered	114 (54.0%)	155 (89.1)	
	absence*	Considered	55 (22.4%)	5 (5.7%)	<0.001
		Not considered	191 (77.6%)	83 (94.3%)	

*: Pearson's chi-square test

**: Fisher exact test

4. Evacuated nurses

Thirty-seven evacuated in Koriyama, which was

Table 4 indicates the number of evacuees among those who considered evacuation in both cities.

significantly higher than in Aizu.

Table 4. Comparison of proportions of evacuated nurses in two cities (n=253)

Category	Koriyama	Aizu	p-value
Evacuated	37 (24.3%)	1 (4.2%)	<0.028
Evacuation considered but not evacuated	115 (75.5%)	23 (95.8%)	

*Fisher exact test

5. Characteristics of Koriyama participants who considered evacuation

Koriyama was faced higher radiation levels and had higher rates of nursing staff who considered

evacuating and who evacuated than Aizu. Therefore, the characteristics of Koriyama's nurses were examined. Table 5 shows that being a staff nurse, being pregnant, and having child(ren) were more common in the group considering evacuation than the other group.

Table 5. Comparisons of Koriyama participants who considered voluntary evacuation (n=456, except pregnancy n=326 [under 45 years old])

Category		Female	Male	p-value
Gender*	Considered	139 (33.0%)	13 (37.1%)	0.619
	Not considered	282 (67.0%)	22 (62.9%)	
Category		Staff nurse	Nurse administrator	p-value
Position*	Considered	130 (35.1%)	20 (23.8%)	0.046
	Not considered	240 (64.9%)	64 (76.2%)	
Category		Presence	Absence	p-value
Pregnancy*	Considered	19 (67.9%)	94 (31.5%)	<0.001
	Not considered	9 (32.1%)	204 (68.5%)	
Category		Presence	Absence	p-value
Adult family member(s)**	Considered	37 (27.4%)	0	0.006
	Not considered	98 (72.6%)	17 (100%)	
Category		Presence	Absence	p-value
Child(ren)*	Considered	97 (46.0%)	55 (22.4%)	<0.001
	Not considered	114 (54.0%)	191 (77.6%)	

*: Pearson's chi-square test

**: Fisher's exact test

Table 6 compares voluntary evacuation considering four family structures (adults and children). Those who lived with adult family member(s) and child(ren) were more likely to consider evacuation than other family structures

($p < 0.05$). In addition, a chi-square test showed that those who lived with adult family member(s) had a significantly higher evacuation rate than those without adult family members ($p < 0.001$).

Table 6. Relationship between voluntary evacuation consideration and four family structures in Koriyama (n=457)

Voluntary evacuation consideration	Lived alone		Lived with adult family member(s) but no child		Lived with no adult family member(s) but with child(ren)		Lived with adult family member(s) and child(ren)		Total
	n	%	n	%	n	%	n	%	
Presence	17 _a	18.7	38 _a	24.5	<5 _a	77	96 _b	48.5	152
Absence	74 _a	81.3	117 _a	75.5	12 _a	92.3	102 _b	51.5	305

* Multiple comparison: the same subscript alphabet means no difference * $p < 0.05$

The relationship between voluntary evacuation consideration and the youngest child's age was examined. Age groups were categorized as under seven years old (preschooler), 7–12 years old (primary school), 13–15 years old (junior high school), and over 15 years old (high school or older). In multiple comparisons, the greatest difference emerged between nurses with preschoolers (more

likely to consider evacuation) and those with children older than 15 years old (less likely; Table 7). The test between preschoolers and over six years old shows that the preschooler group had the higher rate (chi-square test, $p < 0.001$). Similarly, the test between under 13 years old and 13 years old and over showed the former had a higher rate of voluntary evacuation consideration (chi-square test, $p < 0.001$).

Table 7. Relationship between voluntary evacuation consideration and youngest child's age (Koriyama n=211)

Voluntary evacuation consideration	Preschooler (under seven years old)		7–12 years old		13–15 years old		Over 15 years old		Total	
	n	%	n	%	n	%	n	%	n	%
Presence	61 _a	56.5	26 _{a,b}	44.8	4 _{a,b}	30.8	6 _b	18.8	97	46.0
Absence	47 _a	43.5	32 _{a,b}	55.2	9 _{a,b}	69.2	26 _b	81.3	114	54.0

* Multiple comparison: the same subscript alphabet means no difference * $p < 0.05$

6. Characteristics of evacuees in Koriyama

Thirty-seven nurses in Koriyama evacuated. Although there was an evacuee in Aizu, in order to maintain confidentiality, no description of that nurse was provided. The 37 Koriyama evacuees accounted for 8.1% of all Koriyama participants; they were all females between 27 and 54 years old. The characteristics of the 37 evacuees were compared with

those of the 115 non-evacuees, focusing on pregnancy, family structures, and the youngest child's age. The relationship between pregnancy and voluntary evacuation was tested using a chi-square test among 113 nurses who were under 45 years old: 31 evacuees and 82 non-evacuees (Table 8). The pregnant nurses were more likely to evacuate ($p < 0.001$).

Table 8. Relationship between pregnancy and evacuation in those under 45 years old (n=113)

		Evacuated	Not evacuated	p-value
Pregnancy	Presence	11 (35.5%)	8 (9.8%)	<0.001
	Absence	20 (64.5%)	74 (90.2%)	

*Fisher's exact test

Table 9 shows that those who lived with adult family member(s) and child(ren) evacuated more than those who lived alone. The chi-square test indicated that those who lived with adult family member(s) had a significantly higher evacuation rate than those who did not ($p=0.006$). Table 10 indicates that the youngest

child's age did not influence evacuation decisions. A chi-square test between the preschooler group and over six years old group found no difference. The chi-square test also compared the under seven years old group to the over 13 years old group, with no difference found.

Table 9. Relationship between evacuation and four family structures in Koriyama (n=152)

Evacuation	Lived alone		Lived with adult family member(s) but no child		Lived with no adult family member(s) but with child(ren)		Lived with adult family member(s) and child(ren)		Total
	n	%	n	%	n	%	n	%	
Presence	0 _a	0	7 _{a,b}	18.4	<5 _{a,b}	0	30 _b	31.3	37
Absence	17 _a	100	31 _{a,b}	81.6	<5 _{a,b}	-	66 _b	68.8	115

* Multiple comparison: the same subscript alphabet means no difference * $p<0.05$

Table 10. Relationship between evacuation and youngest child's age groups in Koriyama (n=85)

Evacuation	Preschooler (under seven years old)		7-12 years old		13-15 years old		Over 15 years old		Total	
	n	%	n	%	N	%	n	%	n	%
Presence	22 _a	39.3	6 _a	26.1	<5 _a	-	<5 _a	-	29	34.1
Absence	34 _a	60.7	17 _a	73.9	<5 _a	-	<5 _a	-	56	65.9

* Multiple comparison: the same subscript alphabet means no difference * $p<0.05$

7. Interview results

Six nurses participated in the individual interviews. Three decided to evacuate on their own due to their concern about their children's health. The other three were encouraged to make this decision by an obstetrician or parents/relatives.

Four interviewees remained in contact with their nursing director or head nurse. One director offered to exchange phone numbers with an evacuated nurse to stay in contact. Three were in contact with colleagues. Two had no contact with any co-workers.

Two had calls from nursing administrators requesting them to return to work. Four decided to

return on their own. One was confronted by in-laws regarding her return. Some were afraid of colleagues' reactions when they returned to work because they did not share the heavy burden of the nurses who remained; however, they found no critical atmosphere when they returned. Almost of evacuees were gone for fewer than 10 days.

Discussion

1. Influence of FDNPP accident on nurses' voluntary evacuation in two cities

Although the two groups were similar in terms of personal attributes (except for the younger age of Koriyama nurses), the Koriyama group had

much higher proportions of those who considered voluntarily evacuating and who evacuated than Aizu. The sole definitive difference between the two cities was that Koriyama had higher radiation levels than Aizu and Koriyama issued tap water restrictions after detecting 150Bq/kg of radioactive iodine in a water purification plant¹⁰. Consequently, Koriyama residents had greater awareness of the reality of radiation exposure, leading and Koriyama nurses to consider evacuating and evacuate more than Aizu nurses.

2. Characteristics of nurses who considered voluntary evacuation

Koriyama nurses who considered voluntary evacuation were pregnant, lived with adult(s) and child(ren) under 13 years old (especially preschoolers), and were staff nurses. These characteristics might also have been related to their younger age than nurses in Aizu. Adult cohabitant(s) might have influenced nurses' evacuation decisions, discussion of possible future radiation health effects, and so on.

Meanwhile, no differences in considering evacuation emerged due to gender. Of the 35 male nurses, 13 considered voluntary evacuation, along none evacuated; this finding might be a gender issue in terms of prioritizing job responsibilities over family ones, although any choice is justified.

3. Characteristics of voluntarily evacuated nurses

Characteristics of voluntarily evacuated nurses were similar to those who considered voluntary evacuation, but the youngest child's age was not related to the evacuation decision. Although the evacuees in this study were small in number and the decisive factors were complex and multidimensional, the findings of this study suggested that one possible factor was female nurses with adult cohabitants. All 37 evacuees were female, lived with an adult cohabitant, lived with child(ren), and/or had been pregnant. Female nurses seemed to prioritize their children over themselves.

Moreover, a family with multiple adults had advantages such as being able to discuss issues among adults, collect information (e.g., place to evacuate), access transportation, and access affordable resources. Financial affordability was important because, unlike

people officially ordered to evacuate, voluntary evacuees had to pay for all of their own expenses in almost all cases. Financial issues were the most difficult experience of voluntary evacuees during the evacuation period in all Fukushima prefectures⁹.

Evacuees might have faced workplace and community conflicts when they decided to evacuate. Matsunaga¹¹ reported that voluntarily evacuated mothers were strongly stressed by sensing different values related to radiation exposure risk compared to family members or neighbors. Yonemoto¹² also indicated that the same stress was found among voluntarily evacuated nurses with colleagues.

4. Implications for nursing management

Considering these results, preparing to respond as a nursing department during large-scale radioactive disasters would be beneficial, especially as such an emergency could happen in anywhere around the globe. The researchers suggest that nursing departments educate staff about policies related to leaving and returning to the workplace before an incident occurs. It is important to build an effective working environment that does not disrespect evacuated colleagues. Emergencies happen, and nurses face conflicts between their professional responsibilities and personal roles. Especially in the case of a radioactive disaster, it is important that the nursing department respects individuals' decision to leave and ensures that all nurses know to respect such decisions. The nursing department should remind nurses who remain to respect their evacuated colleagues as well. Policies that promote respect for and the importance of all nurses can help avoid negative impacts on both evacuated nurses and nurses who remain.

The nursing department's willingness to return when the resignation or temporal leave is reported and their supportive contact during evacuation are also very important. As the interviewees described, those who had contact with their superiors seemed to have a lower hurdle to return to work and join their colleagues. Nursing administrators should know that, when radiation levels go down, many nurses are likely to come back. Morioka et al.¹³ reported that ratios of nurses per thousand individuals in the general population in three GEJE-affected prefectures dropped in 2011 compared to the 2020

ratios; however, they increased in 2013, except in the most severely damaged areas. Maehara⁵ indicated that 5.2% of all hospital staff left immediately after the accident, with 71% of them eventually returning and the final resignation rate being only 1.5%.

In addition to departmental policies, nursing administrators' support of both the nurses who evacuate and those who remain is indispensable for maintaining robust nursing manpower. Majeed and Jamsheed¹⁴ reported that nurse leaders' emotional intelligence is needed to reduce nurses' turnover intentions. Nursing administrators should treat their staff nurses as being irreplaceable. Arbon et al.¹⁵ reported that willingness to attend work during a disaster was affected by many competing factors that impacted both work and home environments.

Conclusion

Nursing administrators should thoroughly prepare to protect their nurses when a disaster damages their facility and function. The radiation disaster in Fukushima affected many nurses. In emergency situations, nursing departments must equally respect personal decisions to leave or remain and be welcoming of those returning, which should be announced. BCP, including how to manage nursing services with a smaller number of nurses, should be prepared simultaneously.

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Effectiveness of Google Classroom as an online Tool in Teaching and Learning: B.Sc. (Nursing) Student's Perception

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Abstract

Introduction: The global Covid-19 pandemic led to the need for educators to explore online platforms in delivering lessons to students. It has impacted the way things are done in walks of life including nursing education in both developing and developed countries.

Methods: A descriptive correlational study was conducted to determine the effectiveness of Google Classroom (GCR) as an online Tool in Teaching and Learning: B.Sc (Nursing) Student's Perceptions using survey approach among 20,000 undergraduate nursing students studying 1st year to final year in more than 208 nursing institutions. The students were selected using purposive sampling technique. After obtaining permission and informed consent from the participants, data was collected using pretested and validated tools such as background variables proforma of nursing students and rating scale on effectiveness of Google classroom in improving the learning outcomes of the students using Google forms through WhatsApp and e-mails. The collected data was analyzed using descriptive and inferential statistics.

Results: Most of the students had positive perception with overall mean and standard deviation showing effectiveness of GCR as an online tool $m=81.64$, $SD=10.41$.

Conclusion: Implementation of online learning in Nursing education has been perceived favorably by majority of the students. It is important for instructors and institutions to consider the needs and preferences of their students when designing and delivering courses, and also to provide adequate support and resources to ensure that students are able to have an innovative learning experience.

Keywords: Google Classroom, Online Tool, students' perception Teaching and Learning Outcomes

Introduction

The education system has faced severe trouble worldwide in COVID-19 pandemic since the beginning of 2020. In this context every educational institute including nursing colleges has adopted E-learning for smooth continuation of teaching learning process. The educational system has vastly affected due to COVID 19 pandemic situation along with the effect on human life over 3.91 crore people across the globe. UNESCO highlighted that in India, around 32 crores college students are suffering with their learning process due to this pandemic.¹

American Nurses Association (ANA) had suggested in 2010 that, online, virtual, simulated and competency-based learning should be attempted in educational institutions to expand opportunities to students and increase efficiency of nursing students². To minimize the impact of lockdown, medical schools and colleges had to find another approach to teach medical students.

Fortunately, current technology enabled electronic learning (e-learning) to be the core method of teaching the curriculum during the COVID-19 pandemic³. Google Classroom is a free application

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designed by Google to assist students and teachers connect, work together, organize and create assignments, it enables learning to be paperless. As a digital tool, Google Classroom is accessible only to users with Google Apps for Education (GAFE). This is a free collaborative set of tools, these tools include web tools like Google Docs, Google Drive, Gmail, and more. All users with GAFE account, have access to these web tools. Google Classroom can be used at any grade (basic, post basic and tertiary) levels, but this depends on the teachers' and students' competence.⁴

GCR has the ability to create classrooms in a virtual world manage classes and communicate with students without being tied to class schedules. In addition, teachers can give assignments and directly give grades to students. E-learning is learning by utilizing internet technology which has rich content with a broad scope. This study on effectiveness of GCR as an online tool and the perception of nursing students needs to be understood, as very little information exists about the experiences of nursing students regarding online classes in India. This study was done so that the learning experience can be improved for the benefit of students.

Statement of the Problem

A Descriptive Correlational Study to Assess the Perception of B.Sc. (Nursing) Students on Effectiveness of Google Classroom as an Online Teaching and Learning Tool.

Objective of the Study

To assess the effectiveness of Google Classroom as an online teaching and learning tool and perception among college students.

Research Methodology

A descriptive correlational study was conducted in Tamil Nadu using survey approach among 20,000 undergraduate nursing students studying in 208 nursing institutions. The population consisted of all undergraduate nursing students from first year to final year, they were selected by purposive sampling technique. After obtaining the permission and informed consent from the participants, data was collected using pretested and validated tools such as background variable proforma of nursing students that included gender and year of study and Rating scale to assess the perception of students on effectiveness of Google classroom in improving the learning outcomes. Data was collected using Google forms sent through WhatsApp and e-mails. Rating

scale consisted of 5 sub components such as access and attentiveness towards learning, knowledge and skills gained through GCR, meaningful feedback to students, communication and students' limitations with 20 items rated in a 5-point rating scale (Strongly Disagree-1, Disagree -2 Neutral-3 Agree-4 and Strongly Agree-5). The collected data was analyzed using SPSS-21 and presented in tables and diagram.

Results and Discussion

Table 1: Distribution of Background Variables among Nursing Students (N=17,297)

Demographic Variables	Nursing Students	
	f	%
Year of Study		
a. I year	2062	11.9
b. II year	4300	24.9
c. III year	5550	32.1
d. IV year	5385	31.1
Gender		
a. Male	2016	11.7
b. Female	15281	88.3

Table 1 depicts the percentage distribution of background characteristics of nursing students less than 50% of the students i.e. 32.1% (5550) and 31.1% (5385) nursing students were studying third year and fourth year respectively.

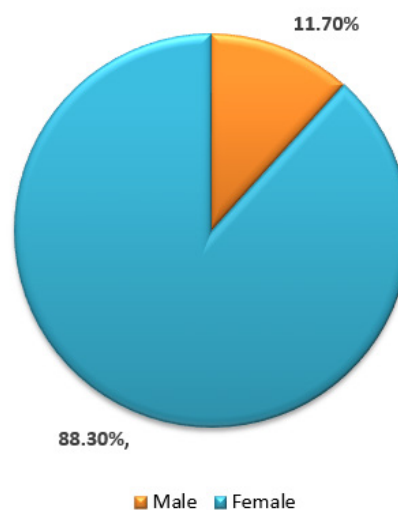


Fig 1: Percentage Distribution of Nursing Students

Fig 1 depicts that majority of nursing students 88.3% (15,281) were females.

Table 2: Item Wise Analysis of Students' Perception on use of GCR in Improving their Access and Attentiveness towards Learning (N=17,297)

Items	Strongly Agree	Agree	Doubtful	Disagree	Strongly Disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
Adequate training	6055(35)	9046(52.3)	1840(10.36)	262(1.5)	94(0.5)
Enhanced critical thinking ability	4167(24.1)	9317.(53.9)	3212(18.6)	463(2.7)	138(0.8)
Improved class attendance	5311(30.7)	8129(47)	3047(17.6)	616(3.6)	194(1.1)
Easy access to class notes	6015(34.8)	8355(48.3)	2345(13.6)	442(2.6)	140(0.8)

Table 2 reveals that more than half of the students felt that they had adequate training to use GCR (52.3%), 53.9% felt their critical thinking skills was

enhanced, 47% had improved attention and 48.3% had easy access to class notes which was shared in GCR.

Table 3: Item Wise Analysis of Students' Perception on use of GCR in gaining Knowledge and Skills. (N=17,297)

Items	Strongly Agree	Agree	Doubtful	Disagree	Strongly Disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
Assignment is easily viewed	6517(37.7)	8653(50)	1579(9.1)	403(2.3)	145(0.8)
collaborative learning	4677(27)	9476(54.8)	2450(14.2)	529(3.1)	165(1)
Innovative and educational tool	5732(33.1)	8756(50.6)	2215(12.8)	436(2.5)	158(0.9)
Independent learner	6043(34.9)	8636(49.9)	2023(11.7)	416(2.4)	179(1)

Table 3 depicts that more than half of the students 50% agreed that class work/assignments could be easily viewed, 54.8% felt the learning was

collaborative, 50.6% had reported that GCR was an innovative and educational tool and 49.9% agreed that GCR made them to be an independent learner.

Table 4: Item Wise Analysis of Students' Perception on use of GCR in providing Feedback to Students. (N=17,297)

Items	Strongly Agree	Agree	Doubtful	Disagree	Strongly Disagree
	f (%)	f (%)	f (%)	f(%)	f (%)
Presence of guardians	5047(29.2)	9166(53)	2644(15.3)	333(1.9)	107(0.6)
Effective record keeping	5540(32)	8960(51.8)	2337(13.5)	353(2)	107(0.6)
Due dates	5047(29.2)	9166(53)	2644(15.3)	333(1.9)	107(0.6)
View their scores online	5394(31.2)	8664(50.1)	2826(16.3)	300(1.7)	113(0.7)
Track their progress regularly	4835(28)	8997(52)	2993(17.3)	349(2)	123(0.7)
Resubmitting of assignments	5217(30.2)	8791(50.8)	2769(16)	374(2.2)	146(0.8)

Table 4 shows that more than half of the students felt that presence of guardians helped them to study seriously (53%). GCR helped in easy and effective record keeping (51.8%), 53% could identify the due

dates easily, view their scores (50.1%), and track their progress regularly (52%), 50.8 percent of students reported that editing and resubmitting assignments helped them to make necessary changes later.

Table 5: Item Wise Analysis of Students' Perception on use of GCR in Communicating with Students (N=17,297)

Items	Strongly Agree	Agree	Doubtful	Disagree	Strongly Disagree
	f (%)	f (%)	f (%)	f (%)	f (%)
Up to date Knowledge	5467(31.6)	9196(53.2)	2237(12.9)	294(1.7)	103(0.6)
Higher Scores in online than in a normal classroom	4861(28.1)	8553(49.4)	3046(17.6)	624(3.6)	213(1.2)
Everywhere & anytime learning	5969(34.5)	8578(49.6)	2275(13.2)	346(2)	129(0.7)

Table 5 reveals that more than fifty percent of students were able to update their knowledge (53.2%), score higher marks through GCR than

normal classroom (49.4%) and learning took place everywhere, any time (49.6%).

Table 6: Item Wise Analysis of Students' Perception on Limitations towards GCR**(N=17,297)**

Items	Strongly Agree	Agree	Doubtful	Disagree	Strongly Disagree
	f (%)	f (%)	f (%)	f (%)	f (%)
Network issues	6280(36.3)	8052(46.6)	2252(13)	501(2.9)	212(1.2)
Lack of money	5650(32.7)	8067(46.6)	2641(15.3)	661(3.8)	278(1.6)
No personal computers or a smart phone	4602(26.6)	7224(41.8)	3133(18.1)	1628(9.4)	710(4.1)

Table 6 depicts that less than fifty percentage of the students reported that they faced network issues (46.6%), financial issues to buy personal computer

(46.6%) and 41.8% had difficulty to recharge their phones.

Table 7: Overall Mean and Standard Deviation of Student's Perception on Effectiveness of GCR as an Online Tool (N=17,297)

Items	Mean	Mean %	S. D	Min	Max
1 Access and attentiveness towards learning	16.34	81.7	2.49	4	20
2. Knowledge and skills gained through GCR	16.53	82.65	2.58	4	20
3. Meaningful Feedback to Students	24.50	81.66	3.70	6	30
4. Communication	12.28	81.86	1.91	3	15
5. Students Limitations	11.96	79.73	2.20	3	15
Overall	81.64	81.64	10.41	20	100

Table 7 reveals that majority of students had positive perception with overall mean score of 81.64 \pm 10.41, domain wise mean and standard deviation of effectiveness of GCR as an online tool. With regard to improving students' access and attentiveness towards learning mean value was 16.34/20 with SD 2.49, knowledge and skills gained through GCR mean value was 16.53/20 with SD 2.58. Meaningful feedback to students was 24.50/30 with SD 3.70. Google classroom made communication with students easy to accomplish with the mean value of 12.28/15 with SD 1.91. Students' limitations towards using GCR mean value was 11.96 with SD 2.20.

Discussion

Technology integration is a benefit for students to learn differently to achieve goals. GCR is a trend of blended learning in education that changes the strategy of delivering learning and teaching. The use of digital technologies in education, complements the traditional approach of teaching.⁵ This study explored the perception of students on GCR as a good e-learning tool used in teaching and learning.

The present study findings revealed that more than half of the students felt that they had adequate

training to use GCR (52.3%), 53.9% felt their critical thinking skills was enhanced, 47% had improved attention and 48.3% had easy access to class notes which was shared in GCR. These findings are consistent with the findings of the study conducted by Muslimah (2018)⁶ which indicated that students felt that GCR was useful and they were satisfied using GCR as an online learning tool. Nizal, et al (2016) also found that students were satisfied using GCR, and reported it as an effective learning tool. Hence, it is well established that GCR was led to a positive perception among the students.⁷

A study was conducted to determine the requirements for the development of learning that is exciting, active, autonomous and effective. Integrated learning design using GCR is needed to improve student digital literacy. In this study more than half of the students 50% agreed that class work / assignments could be easily viewed, 54.8% felt the learning was collaborative, 50.6% had reported that GCR was an innovative and educational tool and 49.9% agreed that GCR made them to be an independent learner, 53% felt that presence of guardians helped them to study seriously. GCR helped in easy and effective record keeping (51.8%), identify the due dates easily (53%), view their scores (50.1%), and track their progress regularly (52%), 50.8% of the students reported that editing and resubmitting assignments helped them to make necessary changes later.⁸

There are many benefits of Google Classroom reported by If takhar in 2014 such as it is very easy to use, designed as an interface to deliver and track assignments and communication with the course simpler through the announcement, email, and push notification.⁹ The process of administering document distribution, grading, giving formative assessment, and giving feedback is simplified and streamlined, so it saves time. It is flexible, can be accessed freely by signing up for a Google Account. GCR is mobile friendly that is designed to be responsive. Google Classroom facilitates collaborative learning. A teacher can upload materials and give feedback to students. The GCR platform has been effective in completing the course work and in the formative evaluation of students.⁹

The global education development agenda reflected in the Goal 4 (SDG4) of the 2030 agenda for Sustainable Development, adopted by India in 2015 seeks to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” by 2030. Such a lofty goal will require the entire education system to be reconfigured to support and foster learning, so that all of the critical targets and goals (SDGs) of the 2030 Agenda for Sustainable Development can be achieved.

Majority of students had positive perception with domain wise mean and standard deviation of effectiveness of GCR as an online tool. With regard to improving students’ access and attentiveness towards learning mean value was 16.34/20 with SD 2.49, knowledge and skills gained through GCR mean value was 16.53/20 with SD 2.58. Meaningful feedback to students was 24.50/30 with SD 3.70. Google Classroom made communication with students easy to accomplish with the mean value of 12.28/15 with SD 1.91. Students’ limitations towards using GCR mean value was 11.96 with SD 2.20. These limitations need to be recognized and rectified for more efficient use of the GCR.

An exploratory study was conducted to investigate whether this application will support learning a Bachelor level of English Language Education program to facilitate student achievement. The test design used to analyze student performance and the survey on perceptions of the use of Google Classroom was evaluated statistically using a questionnaire. The results revealed that students who participated in answering questions at the pretest showed no significant difference between the control group (45%) and experimental group (45.45%). In the posttest results, the two groups obtained an increase within the value of the final examination, however the contribution of 5th-semester students with the utilization of Google Classroom specifically benefited those with higher grades (81.82%) compared to third-semester students (70%). Moreover, the results of the student perceptions survey during this study indicated that the use of Google Classroom was observed positively as a technology which will modernize dynamic learning and engagement, stimulate critical thinking and their participation if used suitably for learning functions.⁸

The students' access and attentiveness were greatly enhanced through GCR. Students are able to learn within the optimal time and pace while the limitations are minimal. The perception of students on online teaching and learning can vary widely depending on factors such as their previous experience with online learning, their access to technology and internet connectivity, and their individual learning styles. Findings of this study indicates that more than fifty percent of students reported that they were able to update their knowledge (53.2%), score higher marks through GCR than normal classroom (49.4%) and learning took place everywhere at any time (49.6%). Less than fifty percentage of the students reported that they faced network issues (46.6%), financial issues to buy personal computer (46.6%) and 41.8% had difficulty to recharge their phones.

Many students found online learning to be convenient and flexible, allowing them to work at their own pace and on their own schedule. They may appreciate the ability to review lectures or course materials multiple times to reinforce their understanding of the subject matter. However, some still struggled with online learning due to a variety of reasons like feeling isolated or disconnected from their peers and instructors. Technical difficulties or issues with internet connectivity also impacted their ability to fully engage with the course material.

Conclusion

The findings of this study proved that Google Classroom enhances the teaching and learning process. It is also reliable, effective and efficient in improving students' access and attentiveness towards learning, activities conducted in Google classroom changes students from passive to active learners. Furthermore, the findings asserted that the students have a positive perception of the use of Google Classroom. Overall, it is important for instructors and institutions to consider the needs and preferences of their students when designing and delivering online courses, and to provide adequate support and resources to ensure that students are able to succeed in their online learning experiences.

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Family Caregiver Experiences in Caring for Diabetic Ulcer Patients: A Phenomenological Qualitative Study

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Abstract

Background: Diabetic ulcers are a complication of diabetes that can affect patients' self-esteem, role, physical mobility, psychology, social, economic status, and life quality. Generally, patients will also experience interference in their daily activities, which requires the help of family caregivers to improve their health status. This study explores family caregivers' experience caring for diabetic ulcer patients at home.

Methods: The research method used was qualitative with a descriptive phenomenological design. A total of 9 participants were recruited as research samples using a purposive sampling technique. Data were collected through in-depth interview techniques and analyzed manually using the Colaizzi Method.

Results: The results of data analysis showed a number of main themes related to patient care by family caregivers, namely to meet basic needs, get care support from the family, benefit the sick family, benefit the family caregiver, lack of wound care support, and no division of roles in caring for patients.

Conclusion: It is recommended to provide educational programs to family caregivers to improve their ability to care for diabetic ulcer patients at home.

Keywords: Diabetic Ulcer, Family Caregiver, Self-Care Deficit

Introduction

Diabetic ulcers are the most common complication of diabetes mellitus (DM), with a risk of amputation and sensory nerve disorders in the extremities, which requires much money for the healing process.¹ The World Health Organization (WHO) estimates an annual increase in the number of people with DM, about 4-10% of them will suffer from diabetic ulcers². Every 21 seconds, one person is diagnosed with DM, which is almost half of the adult population in

America³. Approximately one million individuals are estimated to undergo amputation every year, and every 30 seconds, a person with diabetes undergoes amputation due to a diabetic foot ulcer⁴.

DM is the 6th leading cause of death in Indonesia⁵. The prevalence of diabetic ulcers in Indonesia is 15%, with a 30% amputation rate and a 14.8% post-amputation mortality rate⁶. Data from the Ministry of Health's Basic Health Research of the Republic of Indonesia in 2019 ranked the Aceh Province as the

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seventh-highest in the prevalence of DM nationally, after East Java. Diabetic patients with diabetic ulcers will generally experience impairment in their daily activities, interpersonal relationships, and social roles.¹

Family caregivers play an important role in diabetic foot ulcer care to improve the health status of patients⁷. Family caregivers are directly involved in patient care at home to accelerate the healing process of wounds and infections and meet the various needs of patients with diabetic ulcers.⁸ It is crucial to provide diabetic ulcer patient care according to the level of patient needs, be it total care, partial care, or only educational support⁹.

Previous studies reported that the experience of family caregivers while providing care for patients with diabetic foot ulcers shows that the family's daily routine is disrupted due to care, feelings of guilt because the wound is getting worse, lack of information related to health care, anxiety related to the disease, an increase in the burden of caregiving, and lack of social support and care assistance⁸. Although research related to family experiences as caregivers in caring for patients with diabetic ulcers already exists, the literature study results show that the application of good and correct care in the family that suits the care needs of patients has not been done much and still needs to be explored. This study aims to understand the experiences of family caregivers in caring for their family members with diabetic ulcers.

Materials and Methods

This qualitative study used a phenomenological approach. The participants consisted of nine individuals selected through purposive sampling technique in one of the working areas of a community health center in one sub-district in the western part of Indonesia. The sample inclusion criteria: (1) being able to describe the experience of caring for a family member with a diabetic ulcer; (2) living in the same household with diabetic ulcer patient; and (3) having provided care for a diabetic ulcer patient for at least three months.

Data collection was carried out using in-depth interviews. The interview guide was made based on the results of a literature study focusing on the

experience of family caregivers in meeting the self-care needs of patients with diabetic ulcers associated with Orem's Self-care theory. The interview guide was not structured and was open-ended. Each interview lasted 30-60 minutes. Field note documents were also used. Data was collected from the end of July to the beginning of August 2022, in the home of a diabetic ulcer sufferer, recorded with a voice recorder.

The interview data were transcribed verbatim to facilitate analysis. Data analysis used the descriptive phenomenological analysis method with Colaizzi's approach. The researchers coded the data and then created sub-themes to derive a theme. The researcher asked an external reviewer to see the theme's suitability with the data obtained.

Results

Characteristics of participants

All participants were female, 60% aged between 26 to 45 years, holding a bachelor's degree, and employed as civil servants. The study identified five main themes regarding the participants' experiences caring for family members with diabetic ulcers: meeting basic personal hygiene, nutrition, daily activities, social needs, and infection prevention needs.

Meeting basic personal hygiene needs

Participants stated that fulfilling the personal hygiene needs of their sick family members was the main care need. Quotes from participants included: *"Yes, whatever it is, if she can't do it, we will still help her. Changing her diapers, for example, changing her clothes, and wiping her body"* (Participant No. 2, age 27, female). *"Maintaining her cleanliness"* (Participant No. 9, age 38, female).

Meeting nutritional needs

Informants stated that meeting the nutritional needs of patients with diabetic ulcers was another important aspect of caring for them. Participants explained that their families fulfilled the nutritional needs of diabetic ulcer patients by providing a balanced food menu that minimized sugar and fat levels based on their experiences while caring for ulcer patients at home. Some participants stated: *"The need for food. Her drink should not contain much sugar"*

(Participant No. 2, age 50, female). *“Yes, his food is always taken care of because of diabetes. We watch the sugar and calories”* (Participant No. 7, age 26, female).

Meeting daily activity needs

This subtheme describes how the family meets the patient’s daily activity needs by providing the necessary assistance, whether full or partial. Quotes from participants: *“Her activities have decreased. She can no longer communicate with neighbors and she spends most of their time at home in bed. People sometimes come to visit, and when asked, she will respond. At the very least, she will ask for her hair to be combed... If she can’t do something, we will help her...”* (Participant No. 9, age 38, female). *“We help each other out, sweeping and cleaning her house inside and out”* (Participant No. 6, age 25, female).

Meeting social needs

The informants stated that the family fulfills the social needs of patients with diabetic ulcers by facilitating their interaction processes. The following are the participants’ statements: *“Sometimes friends are visiting. He could no longer walk far. He can only interact at close range”* (Participant No. 3, age 38, female). *She still interacts with neighbors or the environment. It’s just that if she wants to go around, she has to be helped, cared for, escorted”* (Participant number 7, Age 26, female).

Meeting infection prevention needs

Some informants prevent infection in the patient’s wounds by performing wound care. The participants’ statements as follow: *“I clean the wound twice a day and make sure it doesn’t get dirty... For treatment, the wound is routinely cleaned every two days. After cleaning, the wound is bandaged every two days”* (Participant No. 1, age 32, female). *“Usually, when treating mother, we change the bandages and clean the wound”* (Participant No. 3, age 38, female). *“We clean the wound twice a day to prevent it from getting dirty and infected”* (Participant No. 6, age 25, female).

Discussion

This study aims to explore the experiences of family caregivers in providing care for patients with diabetic ulcers receiving treatment at home. It has been reported that family caregivers should ensure proper nutrition, check regular blood glucose level,

facilitate patient interaction with environment, prevent wound infections, and monitor patient activities¹⁰. Personal hygiene is crucial for diabetic ulcer patients to maintain their quality of life despite living with the condition¹.

The finding of this study suggests that a combination of full and partial assistance is needed for patients with diabetic ulcers. When meeting the patients’ personal hygiene needs, total assistance is provided for those completely bedridden due to physical weakness. In such cases, family members directly assist patients with bathing in bed, changing diapers, changing clothes, and combing the patient’s hair. Other participants provide partial assistance, allowing ulcer patients to maintain some degree of independence in their personal hygiene routines and offering help only when needed. The self-care of diabetic ulcer patients is tailored to their specific needs to improve their overall health and well-being¹¹.

Meeting the patients’ nutritional needs is also one of the family experiences when caring for diabetic ulcer patients. Families provided the nutritional needs of diabetic ulcer patients by providing low sugar and low fat foods. Food composition for diabetes mellitus patients should include 50-55% carbohydrates, 25-30% fat, and 20% protein¹². Family support is needed to keep motivating patients always to maintain the nutrients consumed⁷.

The cause of foot ulcers in patients with non-healing diabetic ulcers can be poor food management and hyperglycemia conditions (high blood glucose levels), which result in nerve damage leading to loss of pain sensation, dry skin, muscle weakness, and even tissue death¹³. A good weekly dietary regimen can improve the body’s metabolic control, which in turn influences the progression of wound healing¹².

Additionally, research participants revealed that activity needs are among the things that need to be met in patients with diabetic ulcers. Families assist patients according to the level of assistance needed, whether total, partial, or just assistance⁹. When it comes to meeting the needs of daily activities, families try to help with necessary tasks such as combing hair, changing diapers, changing clothes, bathing, and helping with all other daily activities of patients with ulcers.

Diabetes management includes managing diet, physical activity, and controlling blood glucose levels.¹⁴ Diabetic patients sometimes rarely self-monitor their blood glucose levels and have low physical activity; patients often have a strict diet that is not regular, which has an impact on complications due to diabetes¹⁴. Family support plays an important role in reducing various obstacles to physical activity, family support can generate and trigger positive energy in doing daily physical activity well¹⁵. With the support provided and routine health care, the quality of the patient's health is increasing⁷.

The results of this study also reveal the importance of the need for social interaction of patients with diabetic ulcers with their environment. For patients with total care needs, their need for interaction decreases slightly due to their weak and bedridden condition. Families need to facilitate and help patients so they can still interact with their environment. For example, when family or guests visit, they can talk or invite patients to remain enthusiastic about facing their illness and emphasize that the family will always be there when the patient needs it. Social interaction and support from family, friends, and partners are important components of diabetic ulcer management. Patients feel there is still a place to share their worries and get motivation from the interaction process¹⁶. Social interaction is crucial in reducing loneliness and can improve the quality of life of the elderly with chronic diseases¹.

Meeting the infection prevention needs is also a concern for family caregivers in this study. Families prevent infections by cleaning wounds and changing bandages at healthcare centers and home care. Patients with diabetic ulcers treated by healthcare teams have a much higher healing rate and avoid amputation than those not treated by healthcare teams¹⁷. The significant reduction in amputation rates makes treatment with a healthcare team more recommended to improve patients' quality of life with diabetic ulcers¹⁸. Families stated that their experience in preventing wound infection is by cleaning the wound independently and changing the bandage every two days at home as taught by the nurse. Self-wound care can be done independently by the family, positively affecting care and motivation in healing the disease¹⁹. However, improper self-

care by the family will result in an increased risk of infection, decreased ability to do activities, a longer healing process, and even amputation¹⁹. Family caregivers need to understand how to properly care for diabetic ulcer patients to support the healing process, prevent and inhibit the growth of germs/bacteria in the wound. Maximizing wound care can improve patients' activities and social interactions during their illness.

Research Limitations

The results of this qualitative study cannot be generalized as a general condition that occurs in the province of Aceh related to the experience of family caregivers' experience caring for diabetic ulcer patients at home, so further research is needed regarding this research.

Conclusion and Recommendation

The experience of family caregivers in caring for patients with diabetic ulcers includes meeting patients' basic needs, namely personal hygiene needs, nutritional needs, daily activity needs, social interaction needs, and wound infection prevention needs while at home. Especially community nurses, can further increase their attention to family caregivers' experience caring for diabetic ulcer patients at home.

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Ethical Considerations

Ethical recommendation for the study was obtained from the Research Ethics Commission of the Faculty of Nursing, Universitas Syiah Kuala, with license number 1120172805522. All participants provided their written consents for participation in the study.

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Assessing Nurses' Behavior Toward Safety Huddle Implementation in the Intensive Care Unit

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Abstract

Background: Safety huddles are brief, regular meetings between nurses and physicians aimed at discussing patients' situations in wards, sharing experienced opinions, and reducing risks regarding medication administration. Safety huddles are essential in improving patient safety, particularly in intensive care units. This study aimed to assess nurses' behavior towards safety huddle implementation in the ICUs of King Fahad Hospital, Madinah, Saudi Arabia.

Methods: A cross-sectional research design was utilized, and 115 ICU nurses were recruited using a non-probability convenience sampling technique. A self-administered questionnaire was used to collect data, and the statistical package for social sciences (SPSS) was employed to analyze the data.

Results: The majority of the respondents exhibited good behavior towards safety huddle implementation in the ICUs, with a mean score of 2.76 and a standard deviation of 0.22. The p-values were all greater than the significance level, indicating that the behavior of nurses towards safety huddle implementation in the ICU was the same across all demographic profiles.

Conclusion: Safety huddles have the potential to improve the working environment and clinical practice of nurses in the ICU. This study's findings suggest that nurses in King Fahad Hospital have a positive attitude towards safety huddle implementation. Future research could explore changes in nurses' experiences and perceptions of the benefits and impact of safety huddles and how they overcome challenges and barriers during implementation.

Keywords: Safety huddle, patient safety, intensive care units, nurses' behavior.

Introduction

In the healthcare industry, the provision of high-quality care is of utmost importance. To achieve this goal, it is crucial to establish and implement good standards that can help improve healthcare practices and lead to professionalism. One important approach that has gained popularity in recent years is the

use of safety huddles. Safety huddles are a regular monitoring tool used to provide high-quality care in healthcare organizations.

The daily safety huddle is a powerful communications strategy that is rapidly gaining traction in healthcare organizations across the country. Safety huddles are regular meetings that

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bring together clinical and administrative hospital leaders to identify and address safety issues and concerns quickly and transparently. In healthcare safety, the focus is on patient and staff welfare¹. Safety huddles enable senior members in an organization to create a good care system for the staff by eliminating risks in the workplace. This strengthens coordination and makes it easier to avoid damage².

Although institutions implement huddles in different ways, there are common characteristics among the majority that make huddles effective in improving various outcomes such as patient and staff safety, hospital length of stay, multidisciplinary teamwork, information sharing, management of impending crises, mitigation of existing problems, and trust across departments³⁻⁵. Regular huddling allows for collective learning by allowing participants to draw from a variety of resources and knowledge. One institution, Advocate Health Care, found that its detection of safety events improved by 40% after the implementation of daily, hospital-wide leadership huddles⁶.

To establish and sustain a safety culture within an institution, as well as ensure well-coordinated patient care, the daily leadership safety huddle was created. Its purpose is to serve as a senior briefing that addresses current, past, and future safety and quality issues that affect the institution's patients and employees. The report on how a huddle has been instrumental in improving a variety of outcomes and the mechanism by which the effects are exerted and sustained in a public hospital system^{7,8}.

Patient safety is a key priority for healthcare providers⁹. Studies suggest that two to three safety incidents occur in every 100 consultations, and 4% of these incidents were associated with severe harm¹⁰. Safety huddles provide healthcare workers with the opportunity to discuss any safety events that have occurred, how the event happened, and how to prevent recurrences. The responsibility to conduct these huddles lies with the nurse leader, as they have the authority to advocate for and help healthcare workers figure out how to enhance their practices through these huddles. They can also share with the staff the points of discussion that need to be addressed during the huddle¹¹.

One of the challenges associated with safety huddles is the potential for them to become time-consuming, leading to an increase in overtime for some nurses. To address this issue, the length of the group was limited to five minutes. Anything that was not addressed within the allotted time was skipped, although exceptions were made for useful conversations. As the group became a well-functioning specialized tool, attendance at staff meetings dropped, as information provided at these monthly meetings was repeated during the huddles¹².

Safety huddles are an effective tool for improving patient and staff safety, hospital length of stay, multidisciplinary teamwork, information sharing, management of impending crises, mitigation of existing problems, and trust across departments in healthcare organizations¹³. They provide an opportunity for clinical and administrative leaders to identify and address safety issues quickly and transparently. Although institutions implement huddles in different ways, there are common characteristics that make huddles effective in improving various outcomes. Regular huddling allows for collective learning by allowing participants to draw from a variety of resources and knowledge¹⁴. To establish and sustain a safety culture within an institution and ensure well-coordinated patient care, the daily leadership safety huddle was created. The purpose of this study is to evaluate the effectiveness of safety huddles in improving patient and staff safety in a public hospital system and to understand the mechanism by which the effects are exerted and sustained.

Methods

Study Design:

A descriptive cross-sectional design was utilized to assess nurses' behavior toward safety huddle on patient safety implementation in the intensive care unit of King Fahad Hospital in Madinah, Saudi Arabia. Cross-sectional designs are appropriate for describing the status of phenomena or relationships among phenomena at a fixed point in time.

Study Participants and Sample:

The sample size was calculated using a convenience sampling technique, and 111 nurses

were included from a total population of 120 ICU nurses at King Fahad Hospital.

Setting and Recruitment:

The study was conducted in the critical care units of King Fahad Hospital in Madinah, Saudi Arabia, which has a bed capacity of 400 and a total population of 898 nurses.

Data Collection Procedure:

Data were collected concurrently from the respondents during three visits to the ICU. The data were analyzed using the Statistical Package of Social Sciences (SPSS) software (IBM Corporation v.26) and presented in tables.

Statistical Analysis:

Frequency and percentage were used for descriptive statistics to answer study question number 1. Weighted mean was utilized to analyze study question number 2 assessing the impact of safety huddle in providing a safe environment for nurses and patients in the intensive care units. T-test and ANOVA were utilized to analyze significant differences between demographic characteristics of respondents and nurses' behavior toward safety huddle in providing a safe environment for nurses and patients.

Research Scale/Instrument:

The researcher used an adapted questionnaire, the Stage of Implementation Checklist (SIC) Scale, formulated by Michie et al. (2005), which was later revised in 2020 by Panayiotou. The instrument consisted of 26 self-report closed-ended questions and was validated with a reliability score of Cronbach's of 0.85.

Results

Table 1 shows that, in terms of gender, the survey sample predominantly consisted of females, comprising 96.4% of the respondents, while males accounted for a smaller proportion of 3.6%. When examining the age distribution, the majority of participants fell within the age range of 25 to 30 years old, representing 42.3% of the sample, followed closely by the age group of 31 to 35 years old, with 44.1%. The remaining age groups had smaller representation, with 6.3% of respondents

aged 36 to 40 years old, 3.6% aged 41 to 45 years old, and 0.9% aged 46 to 50 years old. A small portion of respondents, 2.7%, reported being above 50 years old. Regarding educational attainment, the vast majority (99.1%) of participants held a bachelor's degree, while only 0.9% reported having a diploma. Finally, in terms of length of experience, the distribution was relatively balanced, with 31.5% of respondents having 1 to 3 years of experience, 36% having 4 to 6 years, and 16.2% each reporting 7 to 9 years and 10 years and more of experience.

Table 2 provides an overview of the mean values, standard deviations (SD), verbal interpretations, and ranks of statements related to nurses' behavior towards safety huddle implementation in the intensive care unit (ICU). The table presents 26 statements numbered from 1 to 26, along with corresponding mean scores, SD values, verbal interpretations, and ranks.

The mean score represents the average response of the participants to each statement, indicating the degree of agreement or disagreement. The SD value reflects the extent of variability in responses for each statement, providing insights into the level of consensus or divergence among the participants.

The verbal interpretation column categorizes the responses into three categories: "Agree," "Disagree," or "Neither" based on the mean scores. These interpretations provide a concise summary of the participants' overall sentiments towards each statement.

The rank column denotes the relative position of each statement based on the mean scores. A lower rank indicates a higher agreement or disagreement among the participants towards a particular statement.

This table offers a comprehensive overview of the participants' perspectives on various aspects related to safety huddle implementation in the ICU, allowing for a detailed analysis of their attitudes and perceptions.

Table 3 presents the analysis of the significance between nurses' behavior toward safety huddle and their demographic characteristics. The table includes demographic variables such as Gender, Age, Educational Attainment, and Length of Experience.

For each demographic category, the table provides the mean scores, standard deviations (SD), test statistics, degrees of freedom (df), p-values, and interpretation of the results.

Regarding Gender, the mean score for males was 2.63 with an SD of 0.318, while for females, the mean score was 2.77 with an SD of 0.212. The t-test was conducted, resulting in a test statistic of -1.3139 with a p-value of 0.9042. The p-value indicates that the difference in behavior toward safety huddle between males and females is not statistically significant.

For Age, the table presents mean scores and SD values for different age groups. An ANOVA test was performed to assess the significance of differences among these groups. The results showed a test statistic of 0.8 with a p-value of 0.5546, indicating that there is no significant difference in behavior toward safety huddle across different age groups.

Educational Attainment compares the behavior of nurses with different educational backgrounds, specifically Diploma and Bachelors. However, a t-test could not be conducted for Diploma due to one of the groups having only one observation. For Bachelors, the mean score was 2.77 with an SD of 0.22.

The Length of Experience category explores the behavior of nurses based on their years of experience. ANOVA was used to evaluate the significance among different experience groups. The test statistic was 1.94 with a p-value of 0.128, suggesting that there is no significant difference in behavior toward safety huddle based on years of experience.

The null hypothesis states that there is no significant difference in the level of knowledge of the respondents when they are grouped according

to demographics. The rejection of the null hypothesis occurs if the p-value is less than 0.05, indicating a statistically significant difference. However, based on the p-values presented in the table, the results suggest that there are no significant differences in behavior toward safety huddle across the examined demographic characteristics.

Table 1: Demographic Characteristics of Survey Respondents: Gender, Age, Education, and Experience

Demographic	Frequency	Percent
Gender		
Male	4	3.6%
Female	107	96.4%
Total	111	100%
Age		
25 to 30 years old	47	42.3%
31 to 35 years old	49	44.1%
36 to 40 years old	7	6.3%
41 to 45 years old	4	3.6%
46 to 50 years old	1	0.9%
More than 50 years old	3	2.7%
Total	111	100%
Educational Attainment		
Diploma	1	0.9%
Bachelor	110	99.1%
Total	111	100%
Length of Experience		
1 to 3 years	35	31.5%
4 to 6 years	40	36%
7 to 9 years	18	16.2%
10 years and more	18	16.2%
Total	111	100%

Table 2: Mean, Verbal Interpretation, and Rank of Statements on Nurses' Behavior towards Safety Huddle Implementation in the ICU

Statement	Mean	SD	Verbal Interpretation	Rank
1. Lack of knowledge about huddle content	3.89	0.80	Disagree	1
2. Huddles are similar to other activities	2.83	1.14	Neither	10
3. Uncertainty about expectations in huddles	2.50	0.76	Agree	15
4. Huddles seen as another initiative	3.32	0.92	Neither	5
5. Perceived lower importance of views in huddles	2.35	0.86	Agree	21
6. Not responsibility to express concerns in huddles	2.17	0.77	Agree	26

Continue.....

7. Lack of resources to address identified issues in huddles	2.32	0.82	Agree	23
8. Huddles restricted to medically trained staff	2.49	0.99	Agree	16
9. Confidence in attending/leading huddles	3.05	1.09	Neither	8
10. Communication skills deficiency for huddle participation	2.28	0.80	Agree	25
11. Belief that harm reduction efforts have reached their limits	2.40	0.95	Agree	20
12. Expectation of harm reduction through huddles	3.21	1.09	Neither	6
13. Perceived lack of benefits for staff attending huddles	2.41	0.91	Agree	19
14. Concerns about appearing incompetent or lacking knowledge	3.78	0.67	Disagree	2
15. Time constraints hindering huddle implementation	2.77	0.88	Neither	11
16. Huddles potentially diverting staff from essential care duties	2.56	0.90	Neither	13
17. Perception of more important tasks than attending huddles	2.46	0.76	Agree	17
18. Apprehension about saying something inappropriate in huddles	3.51	0.83	Disagree	3
19. Forgetfulness in attending huddles	2.43	0.85	Agree	18
20. Routine inclusion of huddles in work practice	3.11	1.02	Neither	7
21. Discomfort in contributing to huddles	2.34	0.85	Agree	22
22. Perceived as the only or one of the few contributing to huddles	2.29	0.69	Agree	24
23. Quick patient turnover limits the usefulness of huddles	2.85	0.94	Neither	9
24. Difficulty in gathering staff for huddles	2.54	0.96	Neither	14
25. Staff enthusiasm towards holding huddles	3.34	0.87	Neither	4
26. Lack of suitable space for huddles	2.68	0.98	Neither	12
Composite Mean	2.76	0.22	Good	

Table 3: Significance of Nurses' Behavior towards Safety Huddle Based on Demographic Characteristics

Demographic	Mean	SD	Test Statistic	Value	df	p-value	Interpretation
Gender			t-test		109	0.9042	Not Significant
Male	2.63	0.318		-1.3139			
Female	2.77	0.212					
Age			ANOVA		110	0.5546	Not Significant
25-30 years old	2.76	0.23		0.8			
31-35 years old	2.78	0.19					
36-40 years old	2.63	0.36					
41-45 years old	2.87	0.15					
46-50 years old	2.69	0.00					
More than 51 years old	2.79	0.08					
Educational Attainment							
Diploma	2.69	-	t-test				Test not performed
Bachelors	2.77	0.22					
Length of Experience			ANOVA		110	0.128	Not Significant
1 - 3 years	2.75	0.18		1.94			
4-6 years	2.73	0.21					
7 - 9 years	2.87	0.20					
10 years and more	2.77	0.29					

Discussion

Safety huddles play a crucial role in addressing critical issues related to patient safety and medication, with the aim of preventing errors and hospital-acquired infections¹⁵. In the intensive care units, safety huddles are particularly important for ensuring patient safety, improving their condition, and facilitating their transfer to the step-down unit¹⁶. Previous research has highlighted the effectiveness of pre-organized safety huddles in preventing sudden errors and enhancing patient safety in critical care units¹⁷.

In this study, we examined the behavior of nurses in implementing safety huddles in the intensive care unit at King Fahd Hospital. Our findings revealed a higher response rate among respondents aged between 31 and 35, compared to those above 46 years of age. These results are consistent with a study conducted by Lord et al. (2021)¹⁸, which focused on the effectiveness of communication among nurses working in intensive care units during the COVID-19 pandemic. Additionally, nurses with a bachelor's degree showed higher scores in their response to safety huddles compared to those with a diploma. This finding aligns with a study by Goh et al. (2020)¹⁹, which reported that highly educated nurses tend to work independently, while less educated candidates prefer teamwork.

The relationship between length of experience and participation in safety huddles has been examined in previous studies. Khater et al. (2015) and Alquwez et al. (2018) found that nurses with shorter lengths of experience in Jordanian and Saudi Arabian hospitals, respectively, exhibited a greater appreciation for patient safety culture compared to those with longer lengths of experience^{20,21}. Conversely, Bae et al. (2017) reported that less-experienced nurses tended to work collaboratively and contribute more, while more-experienced nurses preferred working independently based on their extensive experience²². Moreover, El-Jardali et al. (2014) discovered that nurses with more years of experience made more positive contributions to patient safety issues than those with fewer years of experience²³. In our study, we observed higher participation rates among nurses with shorter lengths of experience (1-6 years) compared to those with longer lengths of experience (>7 years). This

finding could be attributed to the influence of critical thinking skills on nurses' perception of patient safety issues.

Regarding knowledge and attitude, we found no significant difference in ICU nurses' responses to safety huddles. This lack of difference can be attributed to the awareness among nurses working in the intensive care units regarding the importance of their knowledge, attitude, and safety practices in preventing errors and risk factors. This finding is consistent with studies by Tigari et al. (2018) and Giannetta et al. (2020), which explored the knowledge, attitude, and practices of intensive care nurses regarding pressure injury prevention and medication management to avoid errors during drug preparation and administration to ICU patients, respectively^{24,25}. Additionally, Perri et al. (2018) reported that nurses' scores in knowledge and attitude related to patients' pain on admission to the palliative care unit were not influenced by their demographic characteristics²⁶.

The high scores obtained for statement number 1, which assessed participants' awareness of the issues discussed during safety huddles, can be explained by Stapley et al. (2018), who demonstrated that nurses' awareness of patients' situations could lead to a 50% reduction in patient transfers to the intensive care unit, as observed in a study conducted at a children's medical hospital in Cincinnati²⁷. Furthermore, participants' awareness of the importance of conversations and discussions during quick huddles may have contributed to nurses' confidence in actively participating in safety huddles, as indicated by the high response rate for statement.

Ethical approval: Ethical approval was obtained from the FCMS Fakeeh Collage Medical Sciences FCMS Institutional Review Board and King Fahd Hospital. The respondents were assured that all collected data would be kept confidential and anonymous, and used only for the intended purpose of the study. They were also informed that participation was voluntary and that they could withdraw from the study at any time.

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Social Support and Subjective Well-Being among Adolescents living in Islamic Boarding School in Rural Indonesia

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Abstract

Subjective well-being is essential for adolescents as it affects their social relationships, learning processes, and emotions. Adolescents who have low SWB quickly feel anxious, depressed, and anxious. This study aims to determine the relationship between subjective well-being and social support for adolescents in an Islamic boarding school in Aceh province, Indonesia. This study applied a cross-sectional design involving 169 adolescents living in an Islamic Boarding School in the Aceh province of Indonesia. Data were collected using the Multidimensional Scale of Perceived Social Support (MSPSS), the Scale of Positive and Negative Experience (SPANE), and the Satisfaction with Life Scale (SWLS). The Chi-square test showed a relationship between social support and adolescent subjective well-being (p-value 0.030). Therefore, social support should be considered as an aspect which is needed to be improved to affect subjective well-being among adolescents.

Keywords: subjective well-being, social support, adolescents, and Islamic boarding school

Introduction

Subjective Well-Being (SWB) is related to what one thinks and feels about one's life¹ and is essential for every individual, including adolescents, as it can affect their social relationships, learning processes, and emotions². Adolescents with good SWB will feel successful because they have greater well-being. Usually, they are more social, altruistic, and active and have better conflict management, whereas adolescents with poor SWB quickly feel anxiety, depression, and anxiety¹.

Adolescence is a period of life where individuals have a highly selfish nature and desire to show their existence³. Among adolescents in Indonesia, those

who live in Islamic boarding schools, especially in rural areas, are considered more vulnerable than other groups of adolescents. In Aceh, many families prefer sending their children to Islamic Boarding Schools to continue their junior and high school level of education⁴.

The Ministry of religious affairs of the Government of Indonesia reported 26,975 Islamic boarding schools in Indonesia in 2022⁵. In the province of Aceh, large numbers of Islamic Boarding Schools are found. However, not all of them have adequate resources such as education, access to health, and groceries. The adolescents living in Islamic Boarding Schools experience learning difficulties, strict regulations, limited access to

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health, and regulations and punishment to change their behaviors while residing and studying in Islamic Boarding Schools⁴.

Several factors are implied to be directly related to Subjective Well-Being, such as demographic factors, personality, support, and results achieved at school². This is directly related to mood changes and affects social interactions. A person's social support can be through peers, teachers, and parents⁵. Peers, supportive parents, and a positive environment are essential in increasing adolescents' ability to feel supported or receive social support⁶.

Social support is reported to have a significant positive relationship with SWB among adolescents⁵. Family is an essential factor in social activities that involve parents and teachers; these activities are the main thing where support can be the first step to developing positive interaction and communication. Adolescents in Islamic boarding schools do not live with relatives but with friends, teachers, supervisors, and principals; they are essential in building interpersonal relationships and social roles⁷.

The results of the researcher's analysis while at Islamic Boarding School Aceh Besar found that teenagers who came from out of town rarely, even rarely, had visits from their parents and families; they only communicated by phone on Fridays. Adolescents, with their friends daily, do many things, such as discussing, helping, and understanding each other. The data above shows that there is still little research exploring subjective well-being, so researchers consider the impact of subjective well-being on social support. This research is focused on exploring subjective well-being and social support for adolescents in Islamic boarding schools in Aceh Besar.

Materials and Methods

This study uses a cross-sectional design involving 169 respondents who choose based on the results of the Taro Yamane formula. Samples were selected by simple random sampling using Microsoft Excel. The research respondents were teenagers currently studying at Islamic Boarding School Aceh Besar.

The research was conducted for a week in March 2023. Data collection was carried out by distributing questionnaires to adolescents who had received permission from their parents/guardians and were willing to be respondents in this study. The data collected in this study are subjective well-being, social support, and demographic data such as age, gender, region of origin, and parental income.

a. Subjective Well-Being

Subjective Well-Being is a way for someone to assess how they think and feel about what they have and what is happening in their life. Subjective well-being can be evaluated from life satisfaction and positive and negative affect. Subjective well-being in this study used two questionnaires, namely the Scale of Positive and Negative Experience (SPANE), which consists of 12 question items [9], and the Satisfaction with Life Scale (SWLS), which consists of 5 question items⁸, and have been adopted in Indonesian versions with a good level of reliability to use among Indonesian adolescents⁹.

b. Social support

Social support was measured using The Multidimensional Scale of Perceived Social Support (MSPSS) questionnaire, which contains subscales of family support, friend support, and other significant others^[12]. The questionnaire uses Likert Scale for 12 items and has been tested to use among Indonesian adolescents (Cronbach's Alpha 0.700¹⁰).

c. Statistical Analysis

The data in this study were analyzed using a chi-square test to determine the relationship between social support and subjective well-being.

Result

The results of this study showed that most respondents were aged 12-16 years (79.3%), male (50.3%), area of origin rural (63.9%), and parents' income <UMP Aceh (63.9%). The following is an explanation of the demographic data of the respondents in Table 1:

Table 1: Demographic Data (n=169)

Demographic Data	Frekuensi (f)	Percentage (%)
Age		
Early adolescence (12-16 tahun)	134	79.3
Late adolescence (17-25 tahun)	35	20.7
Gender		
Male	85	50.3
Female	84	49.7
Origin		
Urban	44	26.0
Rural	125	74.0
Parents' income		
≥ UMP Aceh	61	36.1
< UMP Aceh	108	63.9

Bivariate analysis using the Chi-Square test shows a relationship between social support and

subjective well-being ($p=0.030$). Bivariate analysis is further explained in Table 2:

Table 2: The relationship between social support and adolescent subjective well-being in Islamic boarding schools in Aceh Besar (n=169)

Dukungan Sosial	Subjective Well-Being						P-value
	Low		High		Total		
	n	%	n	%	n	%	
Low	11	91.7	1	8.3	12	100	0.030
Medium	40	54.8	33	45.2	73	100	
High	43	51.2	41	48.8	84	100	

Discussion

The analysis results show a significant relationship between social support and subjective well-being in adolescents in Islamic Boarding School Aceh Besar (p -value = 0.030). Social support can be defined as interpersonal relationships related to psychology and material to provide benefits for individuals to overcome a problem, where social support can be felt emotionally or authentically. There are several relevant social support systems, such as natural (family) support systems, peer support systems, religious support systems, and so on. All individual and family support systems are synergistic, where it is a combination that represents a stable and actual source of social support¹¹.

Social support from the family is essential, and this support can positively and negatively affect adolescents' mental health. The role of culture also involves the social support given to adolescents because any support that adolescents get is not only from parents but can be from peers and other important people for adolescents^[16]. In contrast, peer support functions informally, where one individual and another individual significantly influence each other's lives and can achieve reasonable adjustment and growth¹¹.

No individual who enters the community feels happy or prosperous without good relationships, so to be happy or successful in the group requires good social support¹². Teenagers feel connected to

their social environment at school, which is vital to achieving prosperity; the school environment is a significant factor in the socialization and growth of adolescents, influencing the development of identity and educational attainment. Teenagers spend more time at school than anywhere else; at school, they face different cultures or personal backgrounds, positive and negative relationships, and experiences that can contribute to forming social relations with one another¹³. Social support can be an essential resource and coping mechanism for various experiences experienced by adolescents; social support and SWB have a significant relationship¹⁴.

The results of the analysis of social support researchers are one of the essential things for adolescents to be able to adapt, help each other, solve problems, and achieve their goals. The social support adolescents get from friends can be emotional, exchanging information, helping each other memorize Arabic vocabulary, and reminding each other to speak in Arabic and English. Support from the family is provided through materials, visiting at least once a week, and communicating by telephone if the family cannot see the youth at the Islamic Boarding School. Significant others at the Islamic Boarding School are the teachers and the administrators of the Islamic Boarding School, who are there for teenagers every day when in need.

Community nurses have an essential role in increasing subjective well-being in adolescents in Islamic boarding schools. This can be implemented through peer support interventions, teaching method programs¹⁵, and experiential learning¹⁶. In this activity, the nurse becomes a mediator in carrying out the teaching method program by asking youth to express an idea through mind mapping, building meaning in the learning process, involving youth in social activities, and providing motivation¹⁵. The peer support program can be implemented by feeling, observing, reflecting, thinking, and planning. This can foster a sense of empathy for other friends, work together and support each other¹⁵. At the same time, the Experiential Learning (EXL) program applies methods in community service, role-playing, simulations, or adventure programs that aim to increase the sense of empathy and prosocial behavior of adolescents¹⁶. Based on some research, nurses

could be role models in developing health promotion intervention programs related to efforts to improve subjective well-being, which can be implemented through peer support interventions, teaching method programs, and experiential learning by considering adolescents' social support.

The results of this study can be used as a reference for developing school and community-based interventions for adolescents in the form of training, developing extracurricular types, and including them in the curriculum so that it can be an idea for Islamic boarding schools to increase involvement and collaboration with the community of nurses in developing health promotion programs to improve subjective well-being in adolescents. This research is evidence of applying the Health Promotion Model theory to adolescent aggregates, and nurse educators can integrate it into learning community nursing practice related to Subjective Well-Being.

Conclusion

Social support affects subjective well-being, so it impacts adolescent social relations. This can be a recommendation for schools and health centers to increase social support through health promotion.

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Effectiveness of Agility Exercise on Pain and Knee Health Status among Patients with Knee Osteoarthritis

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Abstract

Background: The prevalence of osteoarthritis is thought to be around 4% of the present population. Knee pain is the most common complaint involving a peripheral joint and has been observed to affect 5%–13% of adult populations in Asia. Agility exercise may address the needs of the patients and promote knee health status.

Methods: An experimental study was done to evaluate the effectiveness of Agility exercise on pain and knee health status among patients with knee osteoarthritis. Sixty samples were selected (30 each in experimental and control group) through non probability purposive sampling technique. The pain was assessed by numerical pain intensity scale and knee health status was assessed by modified lower extremity functional scale. The investigator demonstrated Agility exercises to only experimental group for 21 days.

Conclusion: The findings reveal that, in experimental group the pretest and posttest mean score of pain was 7 ± 0.6 and 5.6 ± 1.51 respectively. In experimental group the pretest and posttest mean score of knee health status was 18.4 ± 3.33 and 13.4 ± 3.53 respectively. The calculated 't' value for pain was 12.77 and for knee health status was 18.37 which was greater than the table value. In posttest experimental and control group the mean score for pain was 5.6 ± 1.51 and 7.2 ± 1.2 respectively. In posttest experimental and control group the mean score for knee health status was 13.4 ± 3.53 and 18.5 ± 2.32 respectively. The calculated 't' value for pain was 3.7 and for knee health status was 3.36 which was greater than the table value. Thus it become evident that agility exercise was effective in reducing pain and improving knee health status among patients with knee osteoarthritis. The study concluded that agility was effective on reducing pain and improving knee health status among patients with knee osteoarthritis.

Key Words: Osteoarthritis, Knee health status, Agility exercise, Knee pain

Introduction

The most prevalent type of arthritis in the knee is osteoarthritis. It is a degenerative, "wear and tear" kind of arthritis that most frequently affects persons over the age of 50, however it can sometimes affect younger people. The cartilage in the joint gradually deteriorates

in osteoarthritis.¹ The protecting area between the bones narrows as the cartilage deteriorates, becoming ragged and rough. This may cause painful bone spurs as a result of the friction of the bones.

Osteoarthritis affects 20% of elderly people worldwide and is a source of pain and dysfunction

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for 41% of women and 20% of men. Osteoarthritis is the second most prevalent condition in India, with a prevalence rate ranging from 22 to 39%.² Women are more likely than men to develop osteoarthritis of the knee, and prevalence rates range from 10-15% at age 35 to 35-45% at age 65.³

Osteoarthritis's main clinical symptoms include pain, stiffness, and functional impairment. Management of these patients is a challenge because the condition has a higher impact on the patient's physical function and quality of life. For people with knee osteoarthritis, exercise is crucial.⁴

The Knee Osteoarthritis Research Association International Guidelines recommend a combination of nonpharmacologic and pharmacologic therapies for optimal management of patients with knee osteoarthritis. This recommendation covers 12 nonpharmacologic therapies. These include physical therapist referrals, aerobics, muscle strengthening, aquatic exercise, education and self-care, regular phone calls, crutches, knee braces, heat therapy, and transcutaneous electrical nerve stimulation.^{5,6}

Therapeutic exercises, particularly strength exercises and the use of physical activity in general, are particularly helpful in reducing pain and improving functional status in people with knee osteoarthritis.⁷

A variety of therapeutic exercise recipes are used to relieve symptoms of knee osteoarthritis and improve physical function related to activities of daily living. Because quadriceps muscle weakness is prevalent in patients with knee osteoarthritis, leg strength training is often used in intervention programs. Several lines of evidence suggest that shorter programs incorporating kinesthetic, balance, and mobility (CBA) techniques may result in more rapid symptom relief and functional improvement compared to conventional therapeutic exercise.⁸

Agility exercises are designed to improve dynamic joint stability through a series of physical activities that stress the participant's neuromuscular system and maintain balance and coordination. It also aids in the rehabilitation and prevention of anterior circulation ligament ruptures and ankle sprains in athletes, and has been successfully used in the rehabilitation of a 10-year-old girl with bilateral juvenile rheumatoid arthritis in her knees.⁹

Mobility programs for treating knee osteoarthritis include the introduction of agility techniques based on walking rather than running. By exposing individuals to motor challenges encountered in their daily activities, such as quick turns, stops and turns, balance challenges, and overcoming obstacles, these programs promote higher levels of physical fitness while reducing pain and contribute to the improvement of functions.¹⁰

Current trends indicate that exercise regimens include balance exercises consisting of agility and perturbation training.¹¹ Agility training requires sudden changes in movement and direction. Helps improve knee health, relieve symptoms of osteoarthritis of the knee, quickly improve knee function, balance, and improve daily activities. Hence the researcher felt importance of providing agility exercises among patients with knee osteoarthritis.

Methodology

Quasi experimental pre-test post-test control group design was adopted for this study with 60 patients suffering from knee osteoarthritis. Among them 30 patients were selected for the experimental group and 30 patients were selected for control group. The Numerical Pain Intensity Scale was used to assess the pain and the scoring was done according to the level of the pain. Modified lower extremity functional Scale was used to assess the knee health status and scoring was done according to the functional ability. Informed consent was obtained from all participants and followed the ethical principles. Agility exercise was demonstrated to experimental group and asked the patients to continue for twice daily for 3 days in a week for three weeks. The investigator has done the follow up through phone calls and given a diary for the patients to maintain it. Whereas in control group, patients were carried out with routine care and no agility exercise was given for them.

Results

The frequency and percentage distribution of all participants according to their personal and health related variables are given in the following tables.

Table 1: Frequency and percentage distribution of patients according to their personal variables in experimental and control group. (n=60)

Sl. No	Personal variables	Experimental group		Control group	
		F	%	F	%
1	Age in years				
	35-45	7	23.33	2	6.66
	46-55	13	43.33	18	60
	56-65	10	33.34	10	33.34
2	SEX				
	Male	5	16.66	4	13.34
	Female	25	83.34	26	86.66
3	Educational status				
	No formal education	10	33.33	12	40
	Primary education	10	33.33	8	26.66
	Secondary education	6	20	4	13.34
	Degree	4	13.34	6	20
4	Occupation				
	Professional	4	13.34	3	10
	Daily wages	9	30	11	36.66
	Farmer	9	30	9	30
	Business	3	10	3	10
	House wife	5	16.66	4	13.34
5	Marital status				
	Married	30	100	30	100
	Unmarried	0	0	0	0
	Divorced	0	0	0	0
6	Family income per month				
	Below Rs.5000	12	40	11	36.66
	Rs.5001 to 10000	13	43.33	11	36.66
	Rs. 10001 to 15000	1	3.33	4	13.34
	Above Rs.15001	4	13.34	4	13.34

Table 2: Frequency and percentage distribution of patients according to their Health related variables in experimental and control group.

Sl.No	Health related variables	Experimental group		Control group	
		F	%	F	%
1	Diet				
	Vegetarian	0	0	4	13.34
	Non-vegetarian	30	100	26	86.66
2	Habits				
	Smoking	6	20	2	6.66
	Alcohol	0	0	3	10
	Tobacco chewing	2	6.66	2	6.66
	None	22	73.34	23	76.68

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3	Duration of illness				
	Below 3 months	6	20	4	13.34
	3 to 6 months	7	23.33	8	26.66
	6 to 9 months	4	13.33	9	30
	9 to 12 months	13	43.34	9	30
4	Treatment taken previously				
	Yes	24	80	21	70
	No	6	20	9	30
5	Presence of co-morbid illness				
	Yes	9	30	4	13.34
	No	21	70	26	86.66

Table 3: Frequency and percentage distribution of patients according to pretest and post test scores on pain among patients with knee osteoarthritis in experimental and control group.

Level of pain	Experimental Group				Control Group			
	Pre test		Post test		Pre test		Post test	
	F	%	F	%	F	%	F	%
No pain	0	0	0	0	0	0	0	0
Mild pain	0	0	1	3.34	0	0	0	0
Moderate pain	5	16.66	24	80	6	20	0	0
Severe pain	25	83.34	5	16.66	24	80	6	20
Worst possible pain	0	0	0	0	0	0	24	80

The above table 3 shows that in experimental group, maximum 25(83.34%) participants were having severe pain whereas in posttest maximum 24(80%) were having moderate pain. In control group maximum 24(80%) participants were having severe

pain whereas in posttest maximum 24(80%) were having worst possible pain. There is reduction in the level of pain after agility exercises in experimental group were noted.

Table 4: Frequency and percentage distribution of patients according to pretest and posttest scores on Knee Health status among patients with Knee osteoarthritis in experimental and control group.

Knee health status	Experimental group				Control group			
	Pre test		Post test		Pre test		Post test	
	F	%	F	%	F	%	F	%
Good	0	0	8	26.66	0	0	1	3.34
Average	20	66.66	22	73.34	19	63.34	20	66.66
Poor	10	33.34	0	0	11	36.66	9	30

The above table 4 shows that in experimental group, maximum 20(66.66%) participants were having average knee health status and 10(33.34%) were having poor knee health status, whereas in posttest maximum 22(73.34%) were having average knee health status and 8(26.66%) were good knee health status. In control group maximum 19(63.34%)

participants were having average knee health status, and 11(36.66%) were having poor knee health status, whereas in posttest maximum 20(66.66%) were having average knee health status and 9(30%) were having poor knee health status. The knee health status were improved in experimental group after agility exercises were noted.

Table 5: Mean, standard deviation and mean difference on pre test and post test scores on pain among patients with knee osteoarthritis in experimental and control group.

Groups	Pre test			Post test			Difference in Mean %	df	“t” value	Table value
	Mean	SD	Mean %	Mean	SD	Mean %				
Experimental group	7	0.6	70	5.6	1.51	56.3	13.7	58	3.7*	2.01
Control group	7	0.9	70.3	7.26	1.2	72.6	2.3			

*significant at $p \leq 0.05$ level

The above table 5 shows that in experimental group the pretest mean score is 7 ± 0.6 and mean percentage is 70%, where as in posttest mean score is 5.6 ± 1.51 and mean percentage is 56.3. The mean difference is 13.7. In control group the pretest mean score is 7 ± 0.9 and the mean percentage is 70.3, where as in posttest the mean score is 7.26 ± 1.2

and mean percentage is 72.6. The mean difference is 2.3. Experimental group patients have less pain when compared to the control group patients. The calculated ‘t’ value is 3.7 which is greater than the table value. Thus it is significantly evident that Agility exercise is effective in reducing pain among patients with Knee osteoarthritis in experimental group.

Table 6: Mean, standard deviation and mean difference on pretest and post test scores on Knee health status among patients with knee osteoarthritis in experimental group and control group.

Groups	Pre test			Post test			Difference in Mean %	df	“t” value	Table value
	Mean	SD	Mean %	Mean	SD	Mean %				
Experimental group	18.4	3.33	61.5	13.4	3.53	44.8	16.7	58	3.36*	2.01
Control group	18.6	3.01	62	18.5	3.2	61	1			

*significant at $p \leq 0.05$ level

The above table 6 shows that in experimental group the pretest mean score is 18.4 ± 3.33 and mean percentage is 61.5 % whereas in posttest mean score is 13.4 ± 3.53 and mean percentage is 44.8. The mean difference is 16.7. In control group the pretest mean score is 18.6 ± 3.01 and mean percentage is 62% whereas in posttest mean score is 18.5 ± 3.2 and mean percentage is 61 %. The mean difference is 1. Experimental group patients have Good Knee Health status when compared to the control group patients. The calculated ‘t’ value is 3.36 which is greater than the table value. Thus it is significantly evident that Agility exercise is effective in improving the knee Health status among patients with knee osteoarthritis in experimental group.

In experimental group there is no association found between the level of pain and selected demographic variables such as age in years, sex, education, occupation, marital status, family income per month, diet, habits, duration of illness, any treatment taken previously, any comorbid illness. In control group

there is significant association found between the level of pain and demographic variables such as age, educational status, occupation and duration of illness. There is no association found between pain and selected demographic variables such as marital status, family income per month, diet, habits, any treatment taken previously, any comorbid illness.

In experimental group there is no association found between knee health status and selected demographic variables such as age in years, sex, education, occupation, marital status, family income per month, diet, habits, duration of illness, any treatment taken previously, any comorbid illness. In control group there is association found between knee health status and selected demographic variables such as age in years. There is no association found between the knee health status and selected demographic variables such as sex, education, occupation, marital status, family income per month, diet, habits, duration of illness, any treatment taken previously, any comorbid illness.

Conclusion

The present study was done to evaluate the effectiveness of agility exercise on pain and knee health status among patients with knee osteoarthritis at selected hospitals, Salem. The findings of the study revealed that agility exercise was effective to reducing the pain and improving the knee health status among patients with osteoarthritis. There was no significant association between the level of pain and their selected demographic variables in experimental group. In control group there was significant association found between the level of pain and occupation, age, educational status, duration of illness. There was no significant association between the level of knee health status and their selected demographic variables in experimental group. In control group there was significant association found between the level of knee health status and age.

Relevant to Nursing Practice:

- Nurses can identify the importance of agility exercise and use it as an adjuvant to pharmacological therapy to reduce pain and improving knee health status.
- Nurses can demonstrate the agility exercise for knee osteoarthritis patients and encourage the patients to practice it.
- Nurses can demonstrate agility exercise to improve the functional performance of the patients with knee osteoarthritis.

Relevant to Nursing Education:

- In service education program should be conducted for nurses and help them to gain knowledge regarding agility exercises.
- Provide exposure to various non-pharmacological measures and therapies and update the nursing curriculum.

Conflict of interest: Nil

Source of Funding: Self

Ethical Clearance: Ethical approval was obtained from the institutional ethical committee. Permission sought from the concern authorities of the hospital before conducting the research.

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Training Suggestions for Japanese Head Nurses with Inaccurate Understanding of their Roles and Responsibilities in Initial Phases of Disaster Incidents

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Abstract

Background: During large-scale disasters, hospitals must respond immediately. In such situations, different levels of nurses have different roles and responsibilities. Head nurses in Japan have two types of responsibilities based on the shift, day or night. Assuming that head nurses do not clearly recognize these differences due to their lack of appropriate institutional education, this study aimed to clarify actual conditions of institutional education and head nurses' level of understanding.

Methods: Three questionnaires were developed: one for nursing directors regarding departments' implementation based on the disaster response manual and two true/false questionnaires for head nurses regarding their recognition of roles and responsibilities in disaster response. Twenty hospitals in a national hospital organization in Japan, located in two regions, were studied.

Conclusion: Of the 17 hospitals that responded, 52.2%–35.3% had written roles, responsibilities, and action procedures for head nurses on the day and/or night shift. Education, including orientation and training, was provided for the two shifts in 35.3%–23.5% of the hospitals. In terms of the true/false questions, 154 head nurses from both shifts responded with high accuracy; however, they did not appear to understand that they were commanders of the ward on the day shift and of the hospital on the night shift. The results indicate the need to stipulate head nurses' roles, responsibilities, and action procedures in the disaster response manual and implement institutional education and the provision of action assistant tools.

Keywords: initial disaster response, head nurse, roles, recognition, training

Introduction

Hospitals in Japan developed disaster response manuals (DRMs) after the Great Hanshin-Awaji

Earthquake in 1997; however, many issues related to DRM inefficiency became clear when a larger earthquake occurred in 2011. All workers should

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receive institutional education to know and understand what they should do during a disaster. Hospital nursing departments should have clearly written roles and responsibilities for nurses in their DRMs.

The researchers examined head nurses who were mid-level managers with different roles and responsibilities for the day shift versus the night shift. During the day shift, on weekdays, they managed all nursing services for their own wards. On the weekends and holidays, head nurses assigned to both the day and night shifts were expected to manage the nursing services of the entire hospital. Neoi¹ reported that 89.7% of 130 hospitals in the central region, including Tokyo Metropolitan, had mid-level nursing managers, including head nurses and nurse leaders, on the night shift; 79.5% of them worked two to three night shifts a month, and 85.3% of night shift nurse managers were responsible for managing the whole nursing department. When disasters occur, head nurses have to take immediate actions depending on the shift. Although no scientific report has examined the issue, the researchers observed that head nurses' recognition of the two different roles and responsibilities seemed insufficient.

Regarding Japan's shift systems, a survey by the Japan Federation of Medical Workers' Union² reported that 38.7% of 148 institutions had three shifts and 23.0% had two shifts; furthermore, 0.8% of the nurses were night shift exclusive. For head nurses newly assigned to the night shift, Neoi¹ found that 11.1% completed an established training program while the others learned by shadowing senior head nurses or studying DRM or action procedures on their own¹. Al Harthi et al.³ found that poor informal education contributed to nurses' difficulties in managing disasters.

Therefore, this research analyzed how head nurses understood their two types of roles and responsibilities and made some suggestions for training development based on the findings.

Method

Target population: The research focused on 217 head nurses working in 20 hospitals of a national hospital organization in two regions, including two

ECHs in the regions, that had experienced large-scale natural disasters since 2011.

Period and venue: From June 17 through July 10, 2020. Fukushima Medical University, Japan.

Questionnaire: Three anonymous questionnaires were administered. One questionnaire for nursing directors and two questionnaires for head nurses were developed and sent to the nursing directors of the 20 hospitals for distribution to head nurses. Respondents returned the questionnaires to the researchers using a postage-paid return envelope to ensure that the researchers had no access to the senders' personal information.

Questionnaire development: The first questionnaire was prepared to collect information from nursing directors about their hospital's disaster response preparedness, including the presence of a DRM, written roles and action procedures for head nurses on the day/night shifts in the DRM, institutional orientation and training, and assistance tools (e.g., action card, emergency communication tools, and flow chart) to instruct action procedure. The remaining two questionnaires included true/false questions to measure head nurses' knowledge of their different roles and responsibilities on day and night shifts. As there was no applicable scale or questionnaire, the researchers relied on published information regarding hospitals' business continuity plan (BCP) manuals^{4,5}, BCP headquarter manuals⁶, and action card disaster management⁷⁻⁹ when developing the questionnaires. Savage⁷ explained that "an action card incorporates written information, advice, and orders for members of the hospital's staff". Four of the seven principles advocated by Major Incident Medical Management and Support¹⁰ were also considered as applicable in the initial phases of disaster response.

The researchers assumed that some mistakes would be made during a disaster. For example, head nurses could be uncertain of the hospital or ward command lines, commanders may act improperly based on responsibilities, and their strong tendency to act independently instead of being commanders. Therefore, to determine whether the head nurses understood and choose the right answers in challenging situations during the initial phases of

Continue.....

12										
13										
14										
15										
16	Yes	Yes	Yes	Yes		Yes				
17		Yes			Yes	Yes			Yes	
Total: n (%)	4 (36.7)	3 (27.3)	4 (36.7)	3 (27.3)	2 (18.2)	4 (36.7)	1 (9.1)	2 (18.2)	1 (9.1)	1 (9.1)
Base total: n (%)	9 (52.4)	8 (47.1)	8 (47.1)	6 (35.3)	4 (23.5)	6 (35.3)	4 (23.5)	4 (23.5)	2 (11.8)	1 (5.9)

II. Head nurses

1. General information

Of the 217 head nurses, 154 returned the questionnaires. All were accepted for the analysis, although a few questionnaires were missing a few answers (valid response rate: 70.9%). The median length of working as head nurse was 5.25 years; the range was 0.17–35.25 years. Forty-eight head nurses (31.2%) had worked or were working in the ECH.

Twenty-six(16.9%) out of 154 had experienced a disaster on day duty and nine (5.8%) had done so on night duty.

2. Day shift accuracy rates for 18 true/false questions

Table 2 presents the 18 questions and accuracy rates. For individual scores, the median and range were 77.8% and 26%–100%, respectively. Seventy-seven nurses (50%) scored under the median value.

Table 2. Accuracy rates for 18 true/false questions related to head nurse's roles and responsibilities on day shift when disasters occur (n=154)

	Questions	"Yes" was correct: *	Accuracy rate
A1	I secure my own safety	*	97.4
A2	I go to the disaster response head quarters after I secure my safety		35.1
A3	I go to the director's office of the nursing department after I secure my safety		72.1
A4	I go to my ward when I am out of my ward after I secure my safety	*	99.4
A5	I instruct nurse leaders to check the safety of the whole ward	*	100
A6	I check the safety of the whole ward myself		51.9
A7	I stay at the director's office while receiving reports from the nurse leaders		92.8
A8	I stay at the ward while receiving reports from the nurse leaders	*	88.3
A9	I collect information on other wards' conditions		26.0
A10	I call my staff who are not on duty and check their safety		39.0
A11	I call the director's office using an internal phone or emergency communication tool (such as transceiver) for reporting my ward's condition	*	97.4
A12	After I call the director's office, I instruct the nurse leaders to guide all patients in evacuating the hospital		63.8
A13	After headquarters issues an evacuation order, I instruct the nurse leaders to guide all patients in evacuating	*	96.8
A14	After headquarters issues an evacuation order, I guide all patients with nurse leaders in evacuating		32.5
A15	According to the headquarters' decision, I reallocate nurses and duties in the ward and notify the nurse leaders of the reallocations	*	96.1

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A16	I monitor progress and difficulties during evacuation, reallocating nurses and assigned duties	*	100
A17	I assess and make decisions on everything that occurs in the ward	*	67.1
A18	I report and discuss with the director when I face difficulties making decisions	*	94.8

3. Day shift accuracy rates between correct answers and complete correct answers

the relationship of accuracy rates between the correct answers and the complete correct answers for each unit.

As described in the method section, day shift questions included five units. Table 3 summarizes

Table 3. Accuracy rates between correct answers and complete correct answers per unit on day shift

Category	Place to stay or go when disaster occurs	Who confirms safety of ward	Place to receive reports from nurse leaders	Who has authority to make evacuation decisions	Head nurse's role when evacuation starts
Unit	A2*, A3, A4	A5*, A6	A7, A8*	A12, A13*	A13*, A14
Accuracy rate	99.4%	100%	88.3%	96.8%	96.8%
Complete accuracy rate	32.5%	51.9%not	83.1%	62.3%	30.5%

*: question for which "yes" was correct answer

4. Night shift accuracy rates for 18 true/false questions

of individual scores were 76.6 % and 21.6 %, respectively. Sixty-three respondents (40.9%) scored under the mean value.

Table 4 presents the 20 questions and percentages of correct answers. The mean and standard deviation

Table 4. Accuracy rates for 20 true/false questions related to head nurse's roles and responsibilities on night shift when disasters occur (n=154)

	Questions	"Yes" was correct: *	Correction rate
B1	I secure my own safety	*	98.7
B2	I go to the tentative disaster response headquarters after I secure my safety	*	75.3
B3	I go to all wards after I secure my safety		42.2
B4	I call nurse leaders of all wards using an internal phone or emergency communication tool (such as transceiver) and instruct them to check all wards	*	90.9
B5	I go to all wards and instruct nurse leaders to check their wards		50.0
B6	I go to all wards and check them myself		79.9
B7	I stay at the tentative headquarters and receive reports from nurse leaders	*	79.9
B8	I go to all wards and receive reports from nurse leaders		57.1
B9	I collect information about the whole hospital's condition	*	99.4
B10	I collect information on community and area conditions	*	86.4
B11	I report the condition of the nursing department to the director of the tentative headquarters	*	98.1

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B12	I join discussions at the tentative headquarters	*	87.0
B13	When the tentative headquarters issues evacuation orders, I call all nurse leaders and instruct them to immediately evacuate patients	*	95.5
B14	When the tentative headquarters issues evacuation orders, I go to wards and instruct nurse leaders to immediately evacuate patients		47.4
B15	When the tentative headquarters issues evacuation orders, I join nurses to guide patients to evacuate		51.9
B16	I allocate and assign duties to nurses who come to the hospital voluntarily	*	94.2
B17	I instruct nurses who voluntarily come to the hospital to go their own wards and follow the nurse leader’s instructions		35.1
B18	I discuss and make decisions with other tentative headquarters members on matters that nurse leaders cannot decide by themselves	*	93.5
B19	I judge, decide, and instruct on all issues that nurses face		70.1
B20	I report all conditions and responses to the director of nursing department when they arrive at the hospital	*	99.4

5. Night shift accuracy rates between correct answers and complete correct answers rates between correct answers and complete correct answers.

Table 5 presents the relationship of accuracy

Table 5. Accuracy rates between correct answers and complete correct answers per unit on night shift

Category	Place to stay or go when disaster occurs	Who confirms safety of wards	Receiving reports from nurse leaders or go to wards directly	Who has authority to make evacuation decisions	Allocation of assembled nurses
Unit	B2*, B3	B4*, B5, B6	B7*, B8	B13*, B14	B16*, B17
Accuracy rate	75.3%	90.9%	79.9%	95.5%	94.2%
Complete accuracy rate	37.7%	40.9%	54.5%	33.8%	33.8%

*: question for that “yes” was correct answer

6. Education experience and relationship to scores Head nurses’ institutional orientation and training experience is shown in Table 6.

6.1 Education experience

Table 6. Institutional education experience of head nurses (n=154)

Institutional orientation		Institutional training	
Day shift	Night Shift	Day shift	Night Shift
29 (18.8%)	13 (8.4%)	48 (31.2%)	21 (13.6%)
Contents: Safety confirmation, reporting, evacuation, patients’ care, and nursing staff coordination	Contents: Disaster response, triage	Contents: Roles in DRH, reporting and consultation, safety confirmation, evacuation and guidance	Contents: Establishing tentative DRH, coordination of off duty nurses who voluntarily gather, patient referral, damage assessment, reporting system

6.2 Correlation analysis of the scores and five factors

Five factors—length of time working as a head nurse, ECH work experience, institutional education experience on day and night shifts, institutional training experience on day and night shifts, an number of disasters experienced on day and night shifts—were applied to observe correlations with questionnaire scores using multiple regression.

Collinearity was found between a) length of working and times of training, b) times of working in ECH and number of disasters experienced, c) number of disasters experienced and times of institutional training, and d) times of institutional training and institutional exercise. Each collinearity pair was deleted, and the negative correlation between the score and the length of working on the day shift was statistically significant ($B=-0.20$, $p<0.032$). The remaining analyses of the scores and five factors on the night shift, high score group, and low score group showed no significant correlation.

Discussion

To enable hospital nurses to respond appropriately to disasters, the director's office should implement several steps. First, the roles and responsibilities of nurses at all levels should be stipulated. The contents should be disseminated to different levels of nurses separately via training to ensure that they clearly understand. Finally, helping tools should be provided.

All of the studied hospitals had DRMs; however, half had insufficiently written roles for both day and night shifts. Moreover, it was problematic that action procedures were written for fewer than half the hospitals.

Institutional education, including orientation and training, was also poorly performed. Only 11.8% of hospitals implemented orientation for head nurses on both shifts, and training was provided to 23.5% of day shift head nurses versus 17.6% of night shift head nurses. Although this research did not study the form or quality of the orientation and training, this finding is similar to Neoi's report¹ that head nurses learn their roles and responsibilities mostly by shadowing and self-study. Such a situation might lead to uncertainty about the target lessons.

Training that mimics actual disaster incidents is imperative for enhancing trainees' understanding gleaned from classrooms and increasing their

confidence to perform during disasters effectively. Labrague et al.¹¹ reported that previous disaster experience and disaster-related training enhanced disaster response. Smith and Farra¹² concluded the need to provide training for nurses to obtain competencies and readiness to respond to disasters. Jonson et al.¹³ applied three short computer-based stimulation exercises involving initial disaster management and found that head nurses increased their self-efficacy and management skills. Gilmartin et al.¹⁴ reported that self-confidence is core to clinical nurse leaders' successful job performance.

Three of the 17 hospitals studied provided an assistant tool, such as action cards or flow charts, to both the day shift and night shift. Disasters are unpredictable, and it is human nature to not remember everything, especially during situations involving panic. Thus, tools such as action cards and flow charts should be written using simple language describing what people "should do" in sequence would be very useful.

Recognizing head nurses' uncertainty about their roles and responsibilities seemed to reflect the hospitals' identified DRM-related issues. Many did not understand different roles and responsibilities on the day and night shifts; this phenomenon was more apparent on the night shift. Some unit's respondents chose a correct answer and simultaneously provided an affirmative answer for other choices. This might suggest that their performance cannot be predicted, and such acts might cause confusion in wards or hospitals.

The responses suggested that the majority of respondents did not recognize that, when a large-scale incident occurs, they become the "control tower" and "commander" of their wards on the day shift and of the department of nursing on the night shift. Staff nurses know where the "control tower" is, and the "commander" should be there to make decisions and issue instructions according to available information. On the day shift, the head nurse is "commander" of the ward. They stay at the nursing station and instruct nurse leaders to check on patients' and nursing staff's safety and damages. They do not make evacuation decisions, which is the responsibility of the director of nursing. Including evacuation, head nurses instruct nurse leaders what to do and not to take action by themselves; instead, they should monitor their staff's actions. When making decisions and instructing staff on the night shift as the director's representative, the

“commander” head nurses gather information about the damages inside and outside the hospital and send nurses who voluntarily arrive at the hospital to where resources are scarce. Head nurses hand over authorization and report to the directors when they arrive. Thus, a firm understanding and achievement of required roles and responsibilities might be fundamental to effective responses.

Based on the findings, the researchers make some suggestions for hospital nursing departments. Written roles and responsibilities and action procedures, well-grounded training using actual scenarios for practice, and low-cost action assistant tools should be provided. As training can be challenging to develop, a common module could be developed especially as the studied group was from the same organization. A computerized module could also be considered. Each hospital could modify the module to the specific conditions of each hospital and could be expanded for any other hospital in Japan. Finally, for written action procedures and trainings, trainers should teach head nurses not only what they should do, but also what they should not do in order to eliminate action uncertainty and enhance their self-confidence.

Conclusion

Nursing departments play important roles for both patients and fellow nurses. Therefore, directors and head nurses should have concise knowledge about how to react when they are commanders of the hospital or ward. The studied hospitals in this research had some trainings, exercises, and assistant tools for head nurses, but they were not sufficient. It is necessary to establish and implement institutional education as the majority of hospitals studied had not yet renewed their DRMs with BCP.

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