

Impact of Online Nursing Education: Nursing Students' Knowledge Towards Patient Safety in Nursing Academic Institution, Kolkata, West Bengal, India

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Abstract

Introduction: Online education is rapidly growing as an alternative way of preparing nursing students since the COVID-19 pandemic outbreak. The future healthcare workforce has shifted to an online mode of education. **Objectives:** To assess the impact of online nursing education and nursing students' knowledge on patient safety. **Method:** A descriptive study was done among 209 nursing students using a random sampling technique. Data were collected from demographic information on online education and a self-reported knowledge questionnaire. **Results:** The data revealed that third year (50.72%) and fourth year (49.28%) B.Sc. Nursing students who attended more than 6 months of online classes (55.98%) were from rural residences (67.46%) and faced problems with education material storage (58.85%) and the internet (68.90%). As per opinion, 91.87% students shared that they needed more practice. Data also highlighted that nursing students' (75.12%) knowledge score towards patient safety was very good, with a mean of 24.83, median of 15.68, and SD of 5.49.

Keywords: Online nursing education, knowledge, patient safety, nursing students, demographic data

INTRODUCTION

The novel coronavirus (COVID-19) pandemic has undoubtedly posed a huge challenge to education systems worldwide [1] disrupting the normal teaching-learning system and public health [2]. Face-to-face teaching-learning mode was converted to online mode based on COVID situation [3]. Online

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teaching strategies focused on clinical scenario-based teaching [4]. Students and teachers have managed the technological and infrastructural problems of online education. Patient safety is a fundamental principle of nursing [5]. Nursing education molded the students to be competent through a series of exposure [6]. Nurses' knowledge and practice is the most important dimension of any clinical set-up, to maintain patient safety as they are working in a pivotal role [7]. Adequate nurses' knowledge acts on the prevention of errors and adverse effects [8]. Quality care and patient safety always depend on nurses' adequate knowledge [9] whether she is a nurse-administrator or a novice nurse [10]. Procedural harm to patients is recognized as one of the top 10 causes of disability or death in the world. Thus, during COVID-19 attending online classes and nursing students'

knowledge of patient safety was an important area of evaluation. Strengthening patient safety involves a wide range of actions through training, supervising, educating, and continuing a patient safety culture [8].

METHODOLOGY

Study Design

A descriptive research cross-sectional design with a quantitative approach was adopted to collect, analyze, and interpret the data.

Settings

Alia University College and Sister Florence College of Nursing, Kolkata, India

Participants

A total of 209 Bachelor of Nursing students who had attended more than 6 months of online nursing education, participated in this study. Following were the sampling criteria: (a) nursing students who have attended online classes during the COVID pandemic and (b) willingness to participate.

Sample Size

Krejcie Morgan sample size formula was used.

Data Collection Tools and Techniques

Online Google Form consisting of demographic data and a Structured Knowledge Questionnaire with simple random sampling techniques were used.

Description of Tools

Demographic data consists of students' online education and the Knowledge Questionnaire consists of six dimensions of patient safety: (i) environmental, (ii) medication, (iii) infection control, (iv) fall prevention and safety practices, (v) blood and blood product transfusion, and (vi) communication and patient identification.

Reliability

Reliability was calculated using the Karl Pearson correlation coefficient formula, $r = 0.71$.

Data Collection Procedure and Ethical Consideration

Data were collected after getting ethical and administrative permission.

RESULTS

The data were described by descriptive and inferential statistics.

Tool 1: Demographic Data on Online Education

Table 1 shows that 51.20% of students were within the age group of 22 to 25 years, and the rest of them (48.80%) were in the age group of 18 to 21 years. Third-year (50.72%) and fourth-year (49.28%) students had previous perceptions about online classes.

Table 2 reveals that most of the students' fathers' occupations were government employed (54.55%), and mothers' (75.12%) were home-makers. For the majority (65.07%) of them, family income was less than 8 lakhs rupees per year. Most of the students (67.46%) were from rural residencies, and the majority (78.47%) had no family member working in health services.

Additionally, Table 3 highlights that the majority (55.98%) of students had attended >6 months of online classes, educational tools smartphones (99.04%), and (76.08%) attended online scenario-based practical classes. A maximum of (58.85%) of students faced educational data storage problems, and (68.90%) faced internet connectivity problems. According to students' (91.87%), they need more practice to develop confidence.

Table 1. Sample characteristics including age, education, years of students and online class (N = 209).

Sample	Criteria	Frequency	Percentage (%)
Age in years	22–25	107	51.20%
	18–21	102	48.80%
General education	Above high school	126	60.29%
	HS	83	39.71%
Professional education (B.Sc. Nursing)	B.Sc. Nursing	209	100.00%
Year of B.Sc. Nursing student	3rd year	106	50.72%
	4th year	103	49.28%
Previous perception about online class	Yes	152	72.73%
	No	57	27.27%

Table 2. Sample characteristics including occupation, income residence etc. (N = 209).

Sample	Criteria	Frequency	Percentage (%)
Occupation of father	Service	114	54.55%
	Business	60	28.71%
	Self-employed	35	16.75%
Occupation of mother	Service	52	24.88%
	Homemaker	17	75.12%
Month income of parents	<8 lakh	136	65.07%
	>10 lakh	60	28.71%
	8–10 lakh	13	6.22%
Presence of siblings	Absent	100	47.85%
	Present	109	52.15%
Type of residence	Rural	141	67.46%
	Urban	46	22.01%
	Semi-urban	22	10.53%
Family members in health services	Present	45	21.53%
	Absent	164	78.47%

Table 3. Online educational information of the samples (n=209).

Sample	Criteria	Frequency	Percentage (%)
Duration of online classes attended	<6 months	92	44.02%
	>6 months	117	55.98%
Type of online teaching learning tool used	Smartphone	207	99.04%
	Desktop	2	0.96%
Online data storage on your mobile	Problematic	123	58.85%
	Manageable	86	41.15%
Type of practical online class attended	Scenario based	159	76.08%
	Simulation-based	50	23.92%
Learning environment for online education	Supportive	170	81.34%
	Problematic	39	18.66%
Technical support at home	Yes	193	92.34%
	No	16	7.66%
Internet connectivity during online classes	Supportive	65	31.10%
	Problematic	144	68.90%
Opinion about online classes	Confident	17	8.13%
	Need practice	192	91.87%

Tool 2: Structured Knowledge Questionnaire (Knowledge, Attitude, Practice) Towards Patient Safety

Table 4 highlights that the maximum students' knowledge scores regarding patient safety after attending online classes were (75.12 %) which indicates very good, (12.92%) good, (10.05%) excellent and only (01.91%) were poor.

Mean, Median, and Standard Deviation of Knowledge Score

The data presented in Table 5 shows that the range of knowledge score was 5 to 34, the mean knowledge score was 24.83, the median score was 15.68, and the standard deviation was 5.49.

Table 4. Nursing students' knowledge score towards patient safety ($N = 209$).

Range of knowledge	Knowledge score	Frequency (f)	Percentages (%)
31–40	Excellent	21	10.05%
21–30	Very good	157	75.12%
11–20	Good	27	12.92%
1–10	Poor	4	01.91%

Scoring: Minimum score = 5, maximum score = 34.

Table 5. Range, mean, median, and standard deviation (SD) of knowledge score towards patient safety ($N = 209$).

Variables	Range	Mean	Median	SD
Knowledge	5–34	24.83	15.68	5.49

DISCUSSION

This study revealed that nursing students have very good knowledge towards patient safety though there was an impact of more than six (6) months of online nursing education.

The Present Study is Supported by the Findings of Other Studies

The SARS-COV-2 virus forced all countries to adhere to distance teaching through online education [11] as the COVID-19 pandemic outbreak caused significant morbidity and mortality around the world. Most of the governments throughout the world temporarily closed educational institutions to prevent the spread of infection with a physical distancing policy. This pandemic period has also been affected by staff shortages even though a large percentage (44%) of nurses are doubly employed to manage patient care [12].

Teaching and learning activities have been converted to online distance learning via platforms using Zoom, Google Classroom, WhatsApp groups, video conferences, etc. Maximum students faced problems regarding internet connectivity, and storage of educational data, because of rural residency [13]. It is important to maintain patient safety and nurses were always assessed on this despite the fact the classes are either online or offline [14].

The crisis not only affected the front-line leaders or health workers, but it also affected the total health system. One qualitative phenomenological study was conducted in Turkey to gather experiences among 344 nursing students [15]. Data were collected electronically through WhatsApp, email, Google Forms, Instagram, and Facebook. Data revealed that students experienced and faced lots of problems; distance learning, lack of computers, assignment submission, lack of field practice, lack of mobile data, and trouble in continuing online education [16].

One descriptive study was conducted to assess the nursing student's knowledge, attitudes, and perceptions toward patient safety among 134 medical and nursing students. A knowledge questionnaire

was used to collect the data. Study findings revealed that out of 134 students, 50% had good knowledge regarding patient safety [17].

Patient safety can be defined as the absence of preventable harm or error. Evaluating the nursing students' knowledge on patient safety is most important. A cross-sectional study was conducted in Malaysia at one private university college among 92 nursing students using a purposive sampling technique [18]. Data was collected by a self-reported questionnaire. The data highlighted that out of 92 students, majority of the students had good knowledge of patient safety [19].

Quality of care and prevention of errors is dependent on principles of patient safety [20]. Patient safety is identified as a global priority. Another cross-sectional study was conducted to assess knowledge, attitude, and practice among 172 working nurses toward patient safety. The study results highlighted those nurses had a good level of knowledge (58.7%), attitude (52.9%), and practice (50%) toward patient safety [21].

One descriptive study was conducted to assess the nursing students' level of knowledge and attitude toward patient safety. Data was collected from 370 nursing students using the World Health Organization patient safety questionnaire. Study results revealed that final-year students had significantly higher knowledge [22].

Patient safety became a challenging issue in nursing education and administration for future nursing. One study was conducted in Saudi Arabia using a knowledge, attitude, practice (KAP) questionnaire on biomedical waste management among 229 undergraduate nursing students. The study results showed nursing students had adequate knowledge of biomedical waste management [23]. One comparative study among undergraduate students at Cyprus University and Greece revealed nursing students' knowledge scores were higher in the classroom than in clinical settings [24].

Another study was conducted among 678 nursing students in Oman. Data revealed that 43.2% and 45.4% of students have good knowledge and positive attitudes toward patient safety [25].

Maintaining a patient-safety environment in the work environment is an important key factor. One study was conducted among 78 fourth-year nursing students. Study results highlighted that the mean age group was 23 years plus and the nursing students' knowledge score was significantly higher in the post-test than the pretest knowledge score [26].

Quality healthcare always depends on their knowledge and safety culture [7]. Nurses remain the largest group in healthcare with moral responsibilities. The COVID-19 pandemic raised the need for distance learning or online education. The necessary precautions have been taken with various restrictions, including the suspension of face-to-face classes and the closure of educational institutions [27].

CONCLUSION

The World Health Organization, after assessing the global severity levels and spread of the infection, declared that the outbreak of COVID-19 was a pandemic on 11 March 2020. Nurses' knowledge plays an important role in the health care system. The study results showed nursing students have very good knowledge towards patient safety despite attending online education.

Conflict of Interests

The authors declare that they have no conflict of interest.

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