

Assessment of Knowledge Regarding Nursing Informatics Among Nursing Faculties in Selected Nursing College of Northwest India: Cross-Sectional Study

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ABSTRACT

The current and future health care technologies show vigorous development in all phases in medical care. This cross sectional descriptive study was employed using convenient sampling of 441 nurses' who work in selected institutes, schools and college of nursing in northwest India. The subjects who had at least 1 year teaching experience, also ready to participate in the study and present at the time of data collection were accepted as samples. In comparison, nursing faculty who held doctorate degree in nursing and who were exposed to their session already, i.e. pilot study were excluded from the study. Structured knowledge tool which has been proven by nursing and statistical experts was used for data collection. Ethical consideration was obtained from the respective authorities. Updated consents was taken from the subjects and confirmed about confidentiality of information provided by them. The study showed that nursing faculty had average awareness towards nursing informatics. The mean $\pm$ SD knowledge score of nurses' towards nursing informatics was 12.76 (51.04%) $\pm$ 3.079. Statistically important associations were observed with variables such as age qualification, computer experience, learning computer skills formally from the school, course obtained, adequate number of computers in the institution and free access to institution's computer. To put in shot, nursing faculties need knowledge in order to bring up efficient student nurses, subsequently a better nursing care.

Keywords: knowledge, nursing informatics, nursing faculty

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INTRODUCTION

Currently, we live in the digital era due to tremendous advances in health care. Gradually, this raised the necessity of incorporation of computer technology in providing care not only in the hospital but in all healthcare settings too. In brief, it is defined as the interdisciplinary study design, development, adoption, and application of information technology (IT) – based innovations in healthcare services delivery, management and planning [1]. Nursing informatics (NI) is an application within the field of health informatics, where nurses are involved in the execution

of a computer application in a hospital, nursing home, doctor's office, public health clinics, other health care setting. NI plays a vital role in present world for secure outcome.

Technology plays an important role in education and nursing work in today's dynamic health systems. Most health care employers around the globe expect nurses to be proficient in NI competencies. In clinical practice, effort lists to prompt staff of planned nursing interventions, computer generated client documentation, electronic medical record (EMR), and computer-

based patient record (CPR), monitoring devices that record vital signs and other sizes openly into the client record (electronic medical record), computer-generated nursing care plans and critical pathways, automatic billing for supplies or procedures with nursing documentation and reminders and prompts that appear during documentation to ensure comprehensive charting make it ease when one holds NI acquaintance [2]. However, new nursing graduates have a limited knowledge about NI acquired from their respective nursing schools [3]. The major justification is many nursing schools do not submit NI education at the undergraduate level while only few schools provide an elective informatics course that many nursing students avoid selecting NI [4, 5]. This is because nursing faculty members have limited NI knowledge; therefore, they pass the knowledge gap on to their students [6, 7].

In addition, NI has its advantages in nursing education and research such as computerized record-keeping, computerized-assisted instruction, interactive video technology, distance learning-web based courses, and degree programs, Internet resources and formal nursing courses and degree programs, Presentation software for preparing slides and handouts (PowerPoint and MS Word), Computerized literature searching (CINAHL), Medline and Web sources, the adoption of standardized language related to nursing terms (NANDA), etc. and the ability to find trends in aggregate data, that is data derived from large population groups (Statistical Software, SPSS) [2].

Among healthcare professionals, nurses who work 24/7 indicate that he/she has entire responsibility in patient care. Thus, it requires perfect documentation, filing or monitoring of cardinal parameters in appropriate way by a nurse. There is a constant demand for nurses with sound knowledge of Nursing Informatics (NI) but

many undergraduate nursing schools in North America do not offer sufficient education in informatics as part of their curriculum [8]. The researcher, therefore, conducted the present cross-sectional study with an intention to ensure knowledge of nursing informatics among nursing faculties.

MATERIALS AND METHODS

An exploratory descriptive design was employed to determine the knowledge of nursing faculty towards nursing informatics. 441 nursing faculty from selected institutes, schools or colleges of nursing of northwest India were chosen by convenient sampling for the study. The subjects who had at least 1 year teaching experience, also willing to participate in the study and present at the time of data collection were adopted. Nursing faculty who held doctorate degree in nursing and who were exposed to their session already, i.e. pilot study were excluded from the study. The instrument consisted of demographic data such as age, gender, marital status, residence, qualification, designation, areas/length of nursing experience, level of computer literacy, duration of computer experience, access to computer, confidence with using the internet, frequency of internet use, whether computer skills learnt, if yes, the name of the course and whether certified for that course, whether computer used in daily work, if yes, which activity and the rationale, whether adequate number of computers available in the respective institution and eligibility to have free access to institution's computers; structured knowledge questionnaire with 25 questions related to general knowledge of nursing science (18 questions or 72%) and (7 questions or 28%) about information science, where correct answer scored 1 and wrong answer 0; and *attitude scale* where five – point Likert Scale was used to assess the perspectives and the data was collected by structured interview schedule. The Likert Scale consists of 20

attitudinal statements on 'strongly agree-SA' (score 5), 'Agree-A' (score 4), 'Undecided-UD' (score 3), 'Disagree-DA' (score 2) and 'strongly disagree -DSA' (score 1) for positive statements while 'strongly agree-SA' (score 1), 'Agree-A' (score 2), 'Undecided-UD' (score 3), 'Disagree-DA' (score 4) and 'strongly disagree -DSA' (score 5) for negative statements. There were 10 positive and 10 negative statements. The maximum score considered was 100 for the study. Before the data collection, the investigator obtained the formal permission from the concerned authority of school/ college of nursing, introduced her and explained the purpose of the study. Respondents were explained about the purpose of the study and consent was obtained from the prior to the data collection. Informed verbal consent was taken from each subject before collecting the data.

INDENTATIONS AND EQUATIONS

Table 1, reported that the most of the participants (55.3%) were in age group of 26–30 years and the majority were female 237 (53.7%). The greater part of the subjects were married 245 (55.6%), also resided in urban area 332 (75.3%) while 109 (24.7%) resided in rural area. The major part of the participants was Bachelor of Science in nursing 297 (67.3%). The entire subjects knew how to handle e-mail,

internet, social, and media. In addition, the mainstream of the subjects had less than one year of computer experience 268 (60.8%). All samples had mobile device whereas only 131 (29.7%) owned laptop. Nearly 5.2% had shared and personal computer. The study confirmed that entire samples were confident in using internet and used internet service approximately 2–3 hours/day. Nearly 204 (46.3%) of samples had learnt computer skills formally from a school. The highest number of samples had certificate in computer 68 (15.4%). Sixty two (14.1%) of them had CCC. 33 (7.5%) and forty one participant (9.3%) had obtained DOEEC A Level and DOEEC O Level of computer course. 135 (30.6%) subjects used computer for daily work while 115 (26.1%) of them used computer on daily work for lecture, personal or research purpose and rest 20 (4.5%) used for official purpose. Approximately, 86 (19.5 %) of the samples had adequate number of computers in their institution and 355 (80.5%) did not. The greater part of the participants, all teachers, had access to institutions computer 269 (61%). Secondly, only administrator 82 (18.6%) had access to computer compared to entire students 64 (14.5%). Nearly, twenty six (5.9%) of senior level teachers had an opportunity to access computers.

Table 1. Demographic profile of the subjects (N=441).

Category	Frequency/ Percentage
Age	
< 25	126 (28.6)
26-30	244 (55.3)
31-35	58 (13.2)
36-40	13 (2.9)
Gender	
Male	204 (46.3)
Female	237 (53.7)
Marital Status	
Single	196 (44.4)
Married	245 (55.6)
Residence	

Urban	332 (75.3)
Rural	109 (24.7)
Qualification	
B.Sc. (N)	297 (67.3)
PB B.Sc. (N)	69 (15.6)
M.Sc. (N)	75 (17)
Designation	
Tutor/ Clinical Instructor	366 (83)
Lecturer/ Associative Professor	42 (9.5)
Principal / Professor	33 (7.5)
Duration of Computer Experience	
Less than 1 year	268 (60.8)
1-2 years	23 (5.2)
3-4 years	44 (10)
5-10 years	106 (24)
Access to a computer	
Laptop	131 (29.7)
Shared Computer	27 (6.1)
Personal Computer	23 (5.2)
Mobile device	441 (100)
Have you learnt computer skills formally from a school?	
Yes	204 (46.3)
No	237 (53.7)
Course Obtained	
Certificate in Computer	68 (15.4)
CCC	62 (14.1)
DOEEC O Level	41 (9.3)
DOEEC A Level	33 (7.5)
In your daily work, do you use computer?	
Yes	135 (30.6)
No	306 (69.4)
If Yes, Purpose	
Lecture/Personal/ Research Purpose	115 (26.1)
Official Purpose	20 (4.5)
Do you have adequate number of computers in your institution?	
Yes	86 (19.5)
No	355 (80.5)
Who have free access to institution's computer?	
All teachers	269 (61)
All students	64 (14.5)
Only Senior level teachers	26 (5.9)
Only administrator	82 (18.6)

Figure 1 represents all the subjects knew how to handle e-mail, internet, social, and media. Only 109 (24.7%) of the subjects know data entry whereas 100 (22.7%) of them were aware of data analysis processing. Word processing were known by 128 (29.0%) of the samples, in contrast, 112 (25.4%) of them knew computer

assisted Learning. Search Engines were used by 383 (86.8%).

Figure 2 depicts the mean and standard deviation of knowledge score of nursing informatics was $12.76 (51.04\%) \pm 3.079$. The minimum total score was 7 while maximum scored obtained was 21.

Table 2 revealed that age qualification, computer experience, learning computer skills formally from the school, course obtained, adequate number of computers

in the institution and free access to institution's computer had significant association with knowledge score.

Fig. 1. Cone diagram representing percentage distribution of faculties according to their level of computer literacy.

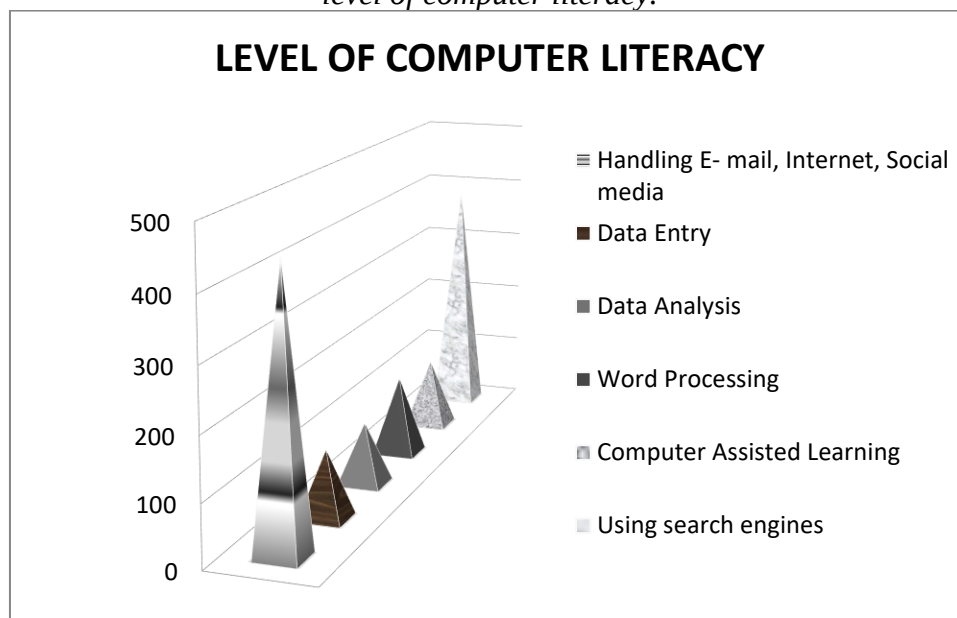


Fig. 2. Pyramid diagram representing mean percentage distribution of knowledge score of nursing faculties.

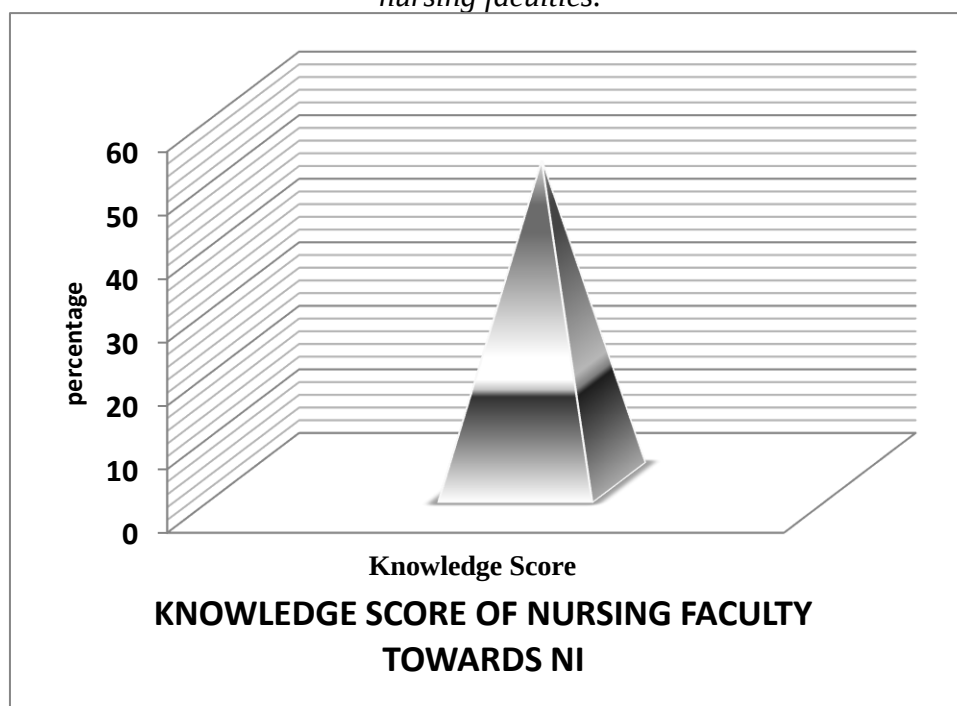


Table 2. Association between the knowledge score and socio demographic variable (N= 441).

Category	Frequency/Percentage	Knowledge
Age		
< 25	126 (28.6)	F = 2.985 p=0.031
26-30	244 (55.3)	
31-35	58 (13.2)	
36-40	13 (2.9)	
Gender		
Male	204 (46.3)	t =0.63
Female	237 (53.7)	p=0.950
Marital Status		
Single	196 (44.4)	t= 0.187
Married	245 (55.6)	p = 0.852
Residence		
Urban	332 (75.3)	t =-0.61
Rural	109 (24.7)	p=0.952
Qualification		
B.Sc (N)	297 (67.3)	F =2.496 P=0.084
PB B.Sc (N)	69 (15.6)	
M.Sc (N)	75 (17)	
Designation		
Tutor/Clinical Instructor	366 (83)	F=0.571 p =0.565
Lecturer/Associative Professor	42 (9.5)	
Principal/Professor	33 (7.5)	
Duration of Computer Experience		
Less than 1 year	268 (60.8)	F=2.281 p=0.079
1-2 years	23 (5.2)	
3-4 years	44 (10)	
5- 10 years	106 (24)	
Access to a computer		
Laptop	131 (29.7)	F = 1.725 p=0.161
Shared Computer	27 (6.1)	
Personal Computer	23 (5.2)	
Mobile device	441 (100)	
Have you learnt computer skills formally from a school?		
Yes	204 (46.3)	t =1.583
No	237 (53.7)	p=0.114
Course Obtained		
Certificate in Computer	68 (15.4)	F =22.255 P=0.001
CCC	62 (14.1)	
DOEEC O Level	41 (9.3)	
DOEEC A Level	33 (7.5)	
In your daily work, do you use computer?		
Yes	135 (30.6)	t =-1.005
No	306 (69.4)	p=0.316
If Yes, Purpose		
Lecture/Personal/ Research Purpose	115 (26.1)	t= -1.482
Official Purpose	20 (4.5)	p=0.141
Do you have adequate number of computers in your institution?		
Yes	86 (19.5)	t=-2.710
No	355 (80.5)	p=0.007
Who have free access to institution's computer?		
All teachers	269 (61)	F = 2.753 p = 0.042
All students	64 (14.5)	
Only Senior level teachers	26 (5.9)	
Only administrator	82 (18.6)	

Statistically significant at p<0.05 * F value

DISCUSSION

This study was conducted to assess the current knowledge among nursing faculties regarding nursing informatics to determine whether they can compete with current technological assessments. NI mainly deals with the resources, devices and methods required to optimize the acquisition, storage and retrieval of health information to utilize in healthcare. Health informatics tools consist of computers, clinical guidelines, formal medical terminologies, and information and communication systems [9, 10]. mHealth stands for mobile health, sub-segment of eHealth, a term used for the practice of medicine and public health supported by mobile services via mobile phones, tablet computers and PDAs for health services and information. On the other hand, it also affects emotional states [11, 12]

General application software for nurse leaders include communication software – provides link for access between computer ; for storing and retrieving data (database management system), to produce documents such as memos, letters, signs, books and resumes (Word processing software), to develop budgets, maintain staff record, calculate, track and create graphs on statistics relating to staff and patient data (Spreadsheets) and contains address book, calendar, email, a journal, notes and tasks (Personal Information Manager Applications). An explorative study was carried out to assess and identify deficit areas of computer knowledge, attitudes and skills among nurses working in the hospital and to examine the relationship among these factors at selected hospital, Ludhiana, India. The sample size was 120 staff nurses and the sampling technique was systematic random sampling. Computer knowledge, attitudes and skills were measured by a self-structured computer knowledge questionnaire, attitude, and skill scale, respectively. Data analysis showed that

majority (75%) of staff nurses had good knowledge whereas (20.8%) of them had average computer knowledge in clinical care setting. The entire subjects (100%) had positive attitude towards computers. Majority of staff nurses (50.8%) had average computer skill, 30.8% of them had fair skill, 15.8% had good computer skill and only 2.5% had poor. None of the staff nurses subjects had excellent computer skill. In concluded, the study pointed that nurse's computer knowledge, attitude were good and positive respectively. Nevertheless, the nurses were not motivated by administration but the clinical staffs are to use computers. The study proposed certain strategies, for nurse administrators, for in-service computer training and also recommended the informatics syllabus to be included in the nursing curriculum [13]. It is evident from the current study the mean knowledge score of nursing informatics was 12.68 (50.72%). The minimum total score was 7 while maximum scored obtained was 21.

A study was conducted to evaluate a Web-enhanced bachelor of nursing curriculum: perspectives of third-year students in Australia. The study examined graduating Bachelor of Nursing (BN) students' perceptions of a Web-enhanced learning environment, their computer literacy skills, and use of technology, and how these influenced their satisfaction. The response rate was 64% (n = 170). Upon graduation, 61.4% of the students described having competent information literacy skills, was rated fair to above average. The students' opinion of technical and faculty support for Web-enhanced learning was low. A regression analysis showed students' overall satisfaction of a Web-enhanced learning environment accounted for 18.5% of variance. In conclusion, more the nursing programs use of Web-based resources, greater attention should be given to the initial assessment and development of students' information

literacy skills. Students with good IT skills are more likely to perceive Web-enhanced material as useful [14]. The present reveals majority of them had average knowledge score 12.68 (50.72%) whereas 71.22 favorable attitude score towards the nursing informatics.

CONCLUSION

The study concludes that the knowledge and attitude of nursing faculty towards nursing informatics can be improved by part of curriculum. To conclude with, nursing Informatics is a developing field of study that is highly interdisciplinary. It is deeply connected to education, business and computer science. The conclusion drawn from the study is that, knowledge and attitude of nursing informatics is still behind though digital India been announced by the current Prime minister of India. Hence, all nursing faculty is mentor of nursing students need to take imitative in training them need high awareness of technology and current innovations to work with health informatics field.

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