

Awareness of Nursing Students Regarding Applications of the Nursing Informatics System in the Community

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Abstract

Background: Nursing informatics has been developed to enhance the effectiveness of healthcare information management and communication. **Aim:** Assess awareness of nursing students regarding applications of the nursing informatics system in the community. **Design:** A descriptive research design was applied in this study. **Sample:** A purposive sample included 140 nursing students. **Setting:** Technical Health Institute at Imbaba. **Tool:** Interview questionnaire consisted of four parts: Part I: Socio-demographic characteristics for nursing students, Part II: Nursing Student's knowledge regarding informatics system, Part III: Nursing students reported practices regarding informatics system Part IV: Nursing student's attitude regarding informatics system in community. **Results:** 25% of nursing students had satisfactory total knowledge level about nursing informatics. 37.9% of the studied nursing students had adequate total reported practices level regarding informatics system. 48.6% of the studied nursing students had positive total attitude level toward informatics system. **Conclusion:** Three quarters of nursing students had unsatisfactory level of total knowledge about nursing informatics system. Less than two thirds of nursing students had inadequate practices regarding nursing informatics system. More than half of nursing students had negative total attitude regarding nursing informatics system. There were positive highly statistically significant correlations between total nursing students knowledge, total reported practices and total attitude regarding nursing informatics system. **Recommendation:** Applying educational programs for nursing students to improve knowledge, practice and attitude toward nursing informatics.

Keywords: Applications, awareness of nursing students, nursing informatics

1. Introduction

The health sector is constantly changing as new ways of treating diseases are found through research. Worldwide, information, communication, and technology have significantly impacted healthcare practice. A new and essential idea in the health care system is using information systems and technologies to improve the quality and safety of patient care (Guna *et al.*, 2020).

Information Technology (IT) is the creation, distribution, and use of information technology in health care to create, store, and manage health information. According to the American Nursing Informatics Association, an informatics nurse uses nursing science, computer science, and information science to collect, process, and manage data to provide nursing principles, clinical care, education, research, and nursing knowledge development (Wager *et al.*, 2022).



Nursing informatics (NI) is a tool for giving safe, high-quality care to patients by letting the organization turn data into valuable knowledge. This, in turn, makes healthcare services more efficient and effective, which is reflected in the organization's overall outcome. Nurses can use technology to find, understand, organise, and evaluate information from different sources to help them make better decisions about patient care and solve problems (Al-Balawi *et al.*, 2020). Also, nursing informatics can lead to better care for patients. But it doesn't look like nursing informatics is making the changes hoped for in nursing services because nurses don't have the right skills or don't know enough about IT. So, nurses need to know more about health information technology and management and more informatics training (Farokhzadian *et al.*, 2020).

Nursing informatics has greatly transformed over the years. With the world revolving around technology in modern times, the topic of nursing informatics is important. Nursing informatics is a continuously evolving field. Nurses use the data from technology and analyze, interpret and evaluate them to promote best care (Ulanday, 2023). In order to store and share data, information, and knowledge to help patients, nurses, and other providers in the decision making process across all roles and contexts, Another word for these technologies that help nurses manage patient care and health care more effectively and efficiently while also increasing nurse accountability is nursing informatics (Kovačić *et al.*, 2022).

Informatics offers many benefits, including: Maintain and improve the quality of care by making it easier to track both patient needs and data from across different providers, reducing errors through more accurate recording systems, keeping up with changes in technology. They are creating better information management practices for compliance purposes. With the ever-growing digitization of healthcare, there is a need for nurses with in-depth knowledge and understanding of how to use technology (Jeffries, 2023).

Today's dynamic health systems, technology applications play an important role in both education and nursing work. The increase in nursing informatics shows that nurses are being automatically integrated into IT; therefore, they should utilize it successfully to improve the quality of care outcomes. Thus, highlighting the appropriate IT educational needs of nurses is necessary. Take advantage of IT also enhance nursing outcomes and healthcare quality, an educational arrangement that equips nurses at different levels to implement IT instruments in all aspects of their profession and integrates them with the ever-increasing pace of technological advances is recommended (Nsouli and Vlachopoulos, 2021).

The nursing students' awareness toward nursing informatics includes knowledge, skills, and abilities such as values, attitudes, critical thinking, and the ability to make clinical decisions. Every student must know much about informatics to provide safe, high-quality care. In addition to promoting safe and high-quality nursing practice, ensuring the right thing is done, helping nursing grow as a profession, making nursing education better, and knowing one's limits (Kinnunen *et al.*, 2022). The nursing student's attitudes are a significant factor that will probably affect how well information technology is put into place. Negative attitudes make it harder for staff to accept and use information technology well. Nurses' attitudes toward its use primarily determine the adoption of a computerized system (Koltsida and Jonasson, 2021).

Nurses must use information and communication technology daily in today's healthcare system. In many places, using a computer is now a job requirement. So, nurses play a very important role as one of the largest providers of health services across the continuum of care, health promotion, and health care at different levels. Because nurses are the main people who collect and use information about patients, the quality of the information they access has always been important for good nursing care (Zareshahi, *et al.*, 2022).

Community health nurses play a crucial role in introducing, implementing and using technology in clinical practices, and possessing digital literacy upon completing nursing baccalaureate studies is imperative. Digital literacy increasingly used in the public discourse, and a core requirement of students, academics, patients and healthcare professionals. Due to the importance of technology in nursing education and practice, introducing digital technologies at the entry-level plays a vital role in preparing nursing students for their academic roles (Singh and Masango, 2020).

Significance of the study:

Information technology can help nurses work more efficiently while also benefiting patients and healthcare organizations, and it is becoming more common in the nursing workplace. Many nurses have little to know computer knowledge and skills concerning the applications used in their workplace. Improving information technology skills is one of the most important and urgent things that need to be done to grow nursing informatics as a field within nursing (Ghonem et al.,2023).

The Egyptian government has been actively promoting the adoption of Electronic Health Record (EHR) systems in the country, providing financial support to healthcare organizations to implement these systems. One of the main goals of the Nursing Informatics System is to build an information system that applies technology to assist management in planning, controlling, decision-making, and providing unparalleled service to patients. In Egypt this system has been applied in many hospitals such as: 57357, Dar Al Fouad Hospital and Al Nas Hospital. It was keen to use the best information technology, which is represented in the use of specialized programs (hospital information systems), a strong information network, an electronic record for each patient and a wide database that covers all medical services (Egyptian Ministry of Health, 2023). Therefore the study aimed to assess awareness of nursing students regarding applications of the nursing informatics system in the community.

Aim of study

The aim of this study was to assess awareness of nursing students regarding applications of the nursing informatics system in the community through:

- 1- Identifying nursing students' knowledge regarding applications of the nursing informatics system in the community.
- 2- Determining nursing students reported practices regarding applications of the nursing informatics system in the community.
- 3- Appraising nursing students' attitude toward applications of the nursing informatics system in the community.

Research questions

- 1- What are the nursing students knowledge regarding applications of the nursing informatics system in the community?
- 2- What are the nursing students reported practices regarding applications of the nursing informatics system in the community?
- 3- What is nursing students' attitude toward applications of the nursing informatics system in the community?
- 4- Is there relation between nursing students' demographic characteristics and their knowledge, practice and attitude?

2. Subjects and Methods

I. Technical Item:

The technical item included research design, setting, subject and tools for data collection.

Research design:

A descriptive research design was used to conduct the study at Technical Health Institute, Imbaba which affiliated to Ministry of health and population.

Type of Sample: A purposive sample included 140 nursing students at Second year at Technical Health institute.

Sample Size: The sample size calculated by using the following statistical equation.

$$n = N/[1+N(e)^2] \quad (\text{Glenn, 1992})$$

n= sample size

N= population size =217

e = 0.05

Therefore, $n = 217 / (1 + 217(0.0025)) = 140$

Tools for data collection: An Interview questionnaire was used in this study it includes four parts

Part I: Socio-demographic characteristics for nursing students include 11 questions as age, sex, marital status, place of residence, birth order, family income, number of family members, number of rooms in the house crowded index rate, work alongside studies and the source of information about informatics system in nursing.

Part II: Nursing student's knowledge regarding informatics system, it was contained 4 sub-items as:

- a. **Knowledge of nursing students about informatics nursing in nursing** involved 5 questions as: Meaning of nursing informatics, importance of nursing informatics, advantages of nursing informatics, disadvantages of nursing informatics and places where nursing informatics is applied.
- b. **Knowledge of nursing students about computer system** involved 5 questions as: Meaning of computer, components of computer, computer pros, computer cons and obstacles for using computers in nursing practices.
- c. **Knowledge of nursing students about uses of informatics system in nursing** involved 4 questions as: Meaning of electronic medical records, importance of electronic medical records, advantages of electronic medical records and disadvantages of electronic medical records.
- d. **Knowledge of nursing students about applications of nursing informatics system in community** involved 6 questions as: Role of telecommunication in nursing informatics, advantages of telecommunication in nursing informatics, disadvantages of telecommunication as an application for the use of informatics in nursing, the necessary principles when using telecommunication as an application for the use of informatics in nursing, the competencies required to apply informatics system in nursing and applications of nursing informatics system in community (tele-nursing).

Scoring system for knowledge items:

A scoring system was followed to assess nursing students' knowledge regarding informatics system. It was contained 20 questions. The total scores were 40 grades.

-Complete correct answer = two points.

-Incomplete correct answer = one point.

-Don't know = zero point.

The nursing students' knowledge was checked with a model key answer. The total scores were summed and converted into a percent score. It was classified into 2 categories:

- Satisfactory knowledge if score $\geq 60\%$ (≥ 24 grades).
- Unsatisfactory knowledge if score $< 60\%$ (< 24 grades).

Part III: Nursing students reported practices regarding informatics system; it was contained 2 sub-items as:

- a. Basic computer skills involved 14 questions as: Apply computer skills (such as turning the computer on and off), use the windows operating system, solve common errors on PC, use antivirus software, store and retrieve files, work with output units (such as a printer), use the Excel application, use external storage devices (such as a CD-ROM), able to use word applications, able to write, use the Power Point application, use the Internet, able to use e-mail messages and use computer systems safely.
- b. Nursing informatics skills involved 11 questions as: Able to collect data and information related to clinical care, use the informatics system in the nursing profession, such as electronic medical records, store and transfer patient data, retrieve patient information, extract data from clinical data, access a set of data shared in hospital information systems, use applications to implement the care plan, such as exit plans, share the interests of patients using computers, use applications in nursing diagnosis, evaluate, implement and evaluate the patient's care plan, communicate between patients and solve their problems.

Scoring system for reported practices:

A scoring system was followed to assess nursing students' reported practices regarding informatics system. It was contained 25 questions. The total score of nursing students reported practices was evaluated as:

- Done = one score.
- Not done = zero score.

Total scores summed up and were converted into a percentage score. It was classified into 2 categories:

- Adequate reported practices if score $\geq 60\%$ (≥ 15 grades).
- Inadequate reported practices if score $< 60\%$ (< 15 grades).

Part IV: Nursing student's attitude toward informatics system in community. It consisted of 21 items using a three-point Likert scale to indicate respondents' attitudes regarding informatics system. It was contained 3 sub-items as:

- a. **Students' attitudes towards the positive aspect of using the nursing informatics system** involved 8 questions as: Believe that nursing informatics facilitates the implementation of nursing tasks, believe that nursing informatics reduces the fatigue and excessive effort of nursing, believe that nursing informatics provides information and skills and allows for increased competencies for nursing, believe that nursing informatics allows cooperation between the health team, believe that nursing informatics compensates the shortage of nurses, believe that nursing informatics is like an eye and a hand for nursing, believe that nursing informatics helps to teach the use of electronic medical records and believe electronic medical records make work easier.
- b. **Students' attitudes towards the negative aspect of using the nursing informatics system** involved 6 questions as: Believe that nursing informatics increases the errors of the health team by not correctly interpreting the data, believe that nursing informatics may increase the stress and burnout of nursing, believe that nursing informatics may cause health risks to nursing, believe that nursing informatics may be difficult for some nurses to

apply it, believe that nursing informatics may take a long time to comprehend and believe that nursing informatics may not contain all the required information.

- C. **Students' attitudes towards the barriers to using the nursing informatics system** (administrative and personal barriers) involved 7 questions as: Computers are not enough, the internet data is incorrect, more senior staff takes priority to use the computer, there is not enough time to use the computer, insufficient knowledge of the use of the nursing informatics system, lack of self-confidence in using the computer and lack of encouragement from management.

Scoring system for attitude:

A scoring system was followed to assess nursing students' attitude regarding informatics system. It was contained 21 questions. The answers were formulated as 3 point likert scale: Agree, neutral and disagree answer categorized as the following:

- Agrees answer = 3
- Neutral = 2.
- Disagree = 1.

The total scores were summed and converted into a percent score. The total points were 63 it was classified into 2 categories:

- Positive if percent score was $\geq 60\%$ (≥ 38 points)
- Negative if the percent score was $< 60\%$ (< 38 points).

Validity:

The developed tool was formulated and submitted to five experts in Community Health Nursing staff in Helwan University to assess the content validity and review the relevance of the tools for clarity, relevance, comprehensiveness, understanding and applicability.

Reliability:

The reliability was done by Cronbach's Alpha coefficient test which revealed that tool consisted of relatively homogenous items as indicated by the moderate to high reliability of each tool as following:

Items	Cronbach's Alpha
Knowledge	0.87
Reported practices	0.90
Attitude	0.81

Ethical consideration:

An official permission to conduct the proposed study was obtained from the Scientific Research Ethical Committee, Faculty of Nursing, Helwan University. Participation in the study was voluntary and subjects were given complete full information about the study and their role before signing the informed consent. The ethical considerations were included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs were be respected.

II. Operational Item:

The operational item included Preparatory phase, pilot study and field work.

Preparatory phase:

It was included reviewing of past, current, national and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection.

Pilot Study:

The questionnaire was pre-tested by 10% (14) of the nursing students before the actual work began to test the clarity of the tools and to estimate the time required to fill the questionnaire after obtaining permission from the manager of Technical Health Institute at Imbaba., no modification done. So the nursing students of the pilot study were included in the studied sample.

Field work:

1. Written approval letter to carry out this study was obtained from Dean of Faculty of Nursing, Helwan University and was directed to manager of Technical Health Institute, Imbaba. Including the aim of the study to obtain permission after establishing a trustful relationship. Students interviewed by the investigator to explain the study purpose.
2. Study was collected through face to face interview and the entire tool was filled by the investigator. Data was collected 3 days per week (Saturday, Sunday and Monday) from 12-2pm of academic year (2022-2023) within 3 months until the needed sample completed. The actual field work started from beginning March till the end of May 2023 for the data collection.
3. The questionnaire took 25-30 minutes to fill in. Students were assured that the information collected would be recorded confidentially and it would be used only for the purpose of the study.
4. The investigator taken 3-4students each day consisted of 12 students per week, and 48 students per month ,total number of students = 144 students.

III. Administrative Item:

Approval to carry out this study was obtained from the dean of the Faculty of Nursing at Helwan University and manager of Technical Health Institute at Imbaba. This letter included a permission to collect the necessary data and explain the purpose and nature of the study.

IV. Statistical Item:

The statistical analysis of data was done by using the computer software of Microsoft Excel Program and Statistical Package for Social Science (SPSS) version 24. Data were presented using descriptive statistics in the form of frequencies and percentage for categorical data, the arithmetic mean (\bar{X}) \pm standard deviation (SD) for quantitative data. Qualitative variables were compared using chi square test (X^2), P-value to test association between two variables.

Degrees of significance of results were considered as follows:

P-value $>$ 0.05 Not Statistically Significant (NS),

P-value \leq 0.05 Statistically significant (S)

P-value \leq 0.01 Highly Statistically significant (HS).

3. Results

Table (1) shows that; 46.4% of the studied nursing students aged 20 years old with mean age was **19.89± 1.19**. 73.6% of them were female, 91.4% of them were single, and 55% were lived in urban areas. Regarding birth order, 38.6% of them were the second, 65% of them had sufficient family income, 54.3% of them had three rooms in the house, and 65% of them didn't work alongside their studies.

Fig. 1: Illustrates that, 43.6% of nursing students knowledge about obstacles for using computers in nursing was administrative obstacles, 27.9% of nursing students knowledge about obstacles for using computers in nursing was personal obstacles and 28.6% of nursing students knowledge about obstacles for using computers in nursing was financial obstacles.

Fig.2: Reveals that, 75% of nursing students had unsatisfactory total knowledge level about nursing informatics, while 25% of them had satisfactory total knowledge level about nursing informatics.

Fig.3: Illustrates that, 37.9% of the studied nursing students had adequate total reported practices level regarding informatics system, while 62.1% of them had inadequate total reported practices level regarding informatics system.

Fig.4: Illustrates that, 48.6% of the studied nursing students had positive total attitude level toward informatics system, while 51.4% of them had negative total attitude level toward informatics system.

Table (2): Reveals that, there were positive highly statistically significant correlations between total nursing students' knowledge, total reported practices and total attitude regarding informatics system.

Table 1. Frequency Distribution of Nursing Students according to their Socio- demographic Characteristics (n = 140).

Socio- demographic characteristics of the studied nursing students	No.	%
Age (years)		
< 20	42	30.0
20	65	46.4
>20	33	23.6
Mean ± SD 19.89± 1.19		
Gender		
Male	37	26.4
Female	103	73.6
Marital status		
Single	128	91.4
Married	12	8.6
Place of residence		
Rural	63	45.0
Urban	77	55.0
Birth order		
The first	37	26.4
The second	54	38.6
The third	34	24.3
*Other	15	10.7
Family income		
Sufficient	91	65.0
Insufficient	33	23.6
Sufficient and saving	16	11.4
Number of family members		
Three	10	7.1

Four	27	19.3
**Other	103	73.6
Number of rooms in the house		
Two	44	31.4
Three	76	54.3
***Other	20	14.3
Crowded index rate		
< 1	10	7.2
1- 2	55	39.2
> 2	75	53.6
Work alongside studies?		
No	91	65.0
Yes	49	35.0

* More than third; ** more than four; *** more than three rooms.

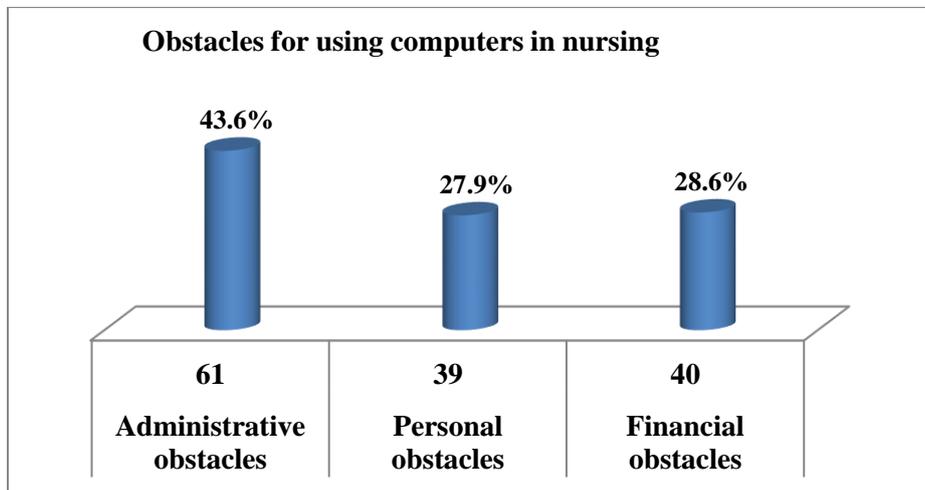


Fig.1. Percentage Distribution of Nursing Students According to their Knowledge about Obstacles for Using Computers in Nursing Practices (n = 140).

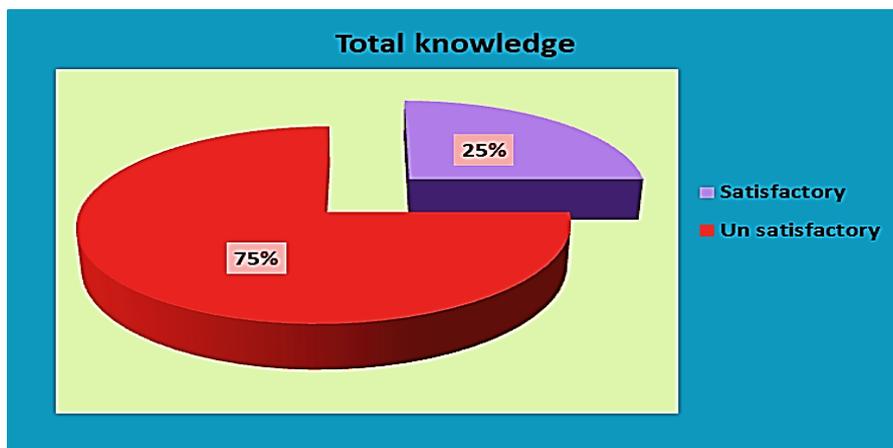


Fig.2: Percentage Distribution of the Studied Nursing Students' Total Knowledge about Nursing Informatics (n=140).



Fig.3: Percentage Distribution of the Nursing Students Total Reported Practices Regarding Informatics System (n=140).

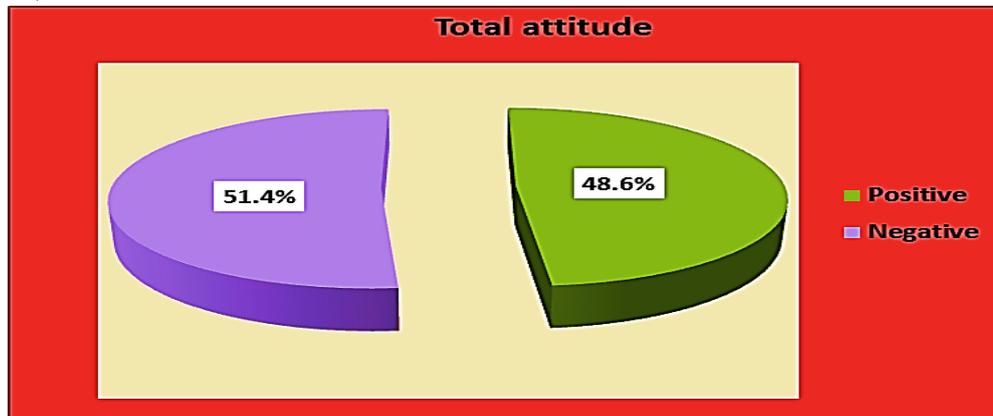


Fig.4: Percentage Distribution of the Studied Nursing Students Total Attitude Regarding Informatics System (n=140).

Table (2): Correlation Matrix between Total Nursing Students' Knowledge, Total Reported Practices and Total Attitude level toward Informatics System (n = 140).

Variables		Total knowledge	Total reported practices	Total attitude
Total knowledge	r	1	0.740	0.594
	p-value		0.000**	0.000**
Total reported practices	r	0.740	1	0.803
	p-value	0.000**		0.000**
Total attitude	r	0.594	0.803	1
	p-value	0.000**	0.000**	

4. DISCUSSION

The increasing use of technology in nursing practice requires nursing students to be competent in nursing informatics with an attitude of acceptance of technology in the healthcare environment. Healthcare has experienced rapid transformation with the development of digital technologies which aim to make healthcare safer and more efficient. In

response, health informatics has evolved, including nursing informatics, which integrates nursing, information and communication technologies (ICT) and professional knowledge to improve patient outcomes (**Kleib et al., 2019**).

The entire world is increasing potential to use information system at all fields and also nursing, to improve the quality of nursing services. Nurses are the most persons close to the patients and usually using information technology systems at work. It is essential to prepare the nursing students for their future roles to be aware of using information technology in nursing practice. Nonetheless, there are little researches on assessing informatics competencies or attitudes toward informatics uses among nursing students (**Koltsida and Jonasson, 2021**).

Regarding age of nursing students, the finding of the current study showed that approximately half of nursing students' age was twenty years where mean \pm SD was 19.89 ± 1.19 (Table 1). This result was agreed with **Adam et al. (2022)** in Egypt (n=180) who studied "Factors contributing to the application of information technology system and their benefits" and showed that 56.7% of the studied sample their age was 20 years. This might be due to the sample of the study was in the second year of Nursing Institute.

Regarding gender and marital status, the current study revealed that nearly three quarter of nursing students were female and majority were single, respectively. These results were in agreement with the findings of **Chipps, (2022)** in South Africa (n=198) who studied "Nursing informatics skills relevance and competence for final year nursing students" as found that 65% were female and 71.4% of the respondents were single. From the investigator point of view, the need for the female nurses is greater than male, due to there are separate sections for women, and clinics in the women's section more than the other.

Concerning residence of nursing students, the current study showed that more than half of them live in urban areas. These results are inconformity with results of **Rashed et al. (2022)** in Egypt, who studied "Designing and implementing electronic health records software for intern-nurses by using advanced mobile devices" (n= 60) as they found that 90% of the respondents were living at rural areas. From investigator point of view, in urban areas, the chance to nursing students to acquire knowledge toward nursing is high because of many hospitals and clinics, and due to the availability of job opportunities in cities.

The current results showed that more than half of student's family income were sufficient, this is on the contrary of **Bello et al. (2019)** in Egypt who studied "Utilization of information and communication technology among undergraduate nursing students in Tanta University" (n=504) as revealed that 53.0% of the studied sample had enough and saving.

Regarding work alongside studies the present study showed that nearly two thirds of students were not working (table 1). Likewise **Mohamed and Abouzaied, (2022)** in Egypt (n=103) who studied "Self-assessment of nursing informatics competencies and attitudes among baccalaureate-nursing students" as revealed that 89.32% of participants did not work alongside studies.

According to research question no. (1) What are the nursing students knowledge regarding applications of the nursing informatics system in community?

Related to nursing students knowledge about obstacles for using computers in nursing, the present study revealed, more than Two fifth of opinions were administrative obstacles figure (1). This result was in the same line with

the study conducted by **Esheiba and Mohammed, (2018)** in Egypt who conducted a study entitled “Knowledge Attitude and Barriers of Using Electronic Documentation among Nurses Working in Family Health Centers in Alexandria Governorate Egypt” (n=184) they found 46.8% of the respondent nurses reported that obstacles of organization was one of the obstacles for using computers in nursing.

Regarding to total knowledge about nursing informatics, the current study showed that three quarters of students had unsatisfactory total knowledge level regarding informatics system figure (2). These results are conversely with the findings of **Ademuyiwa et al. (2020)** in Nigeria who conducted a study entitled “Knowledge and use of nursing informatics among nursing students in a University Teaching Hospital in Lagos, Nigeria” (n=162) they found 75% of the respondent had satisfactory level of total knowledge about nursing informatics.

Also this finding was consistent with results of **Farzandipour et al. (2021)** in Iran who conducted a study entitled “Designing a national model for assessment of nursing informatics competency” (n=200) who found that 73.8% of student nursing were not very good at knowing about informatics, they had unsatisfactory level of total knowledge about nursing informatics.

According to research question no. (2) What are the nursing students reported practices regarding applications of the nursing informatics system in the community?

Related to total reported practices regarding applications of the nursing informatics system, the current study showed that less than two thirds of studied sample had inadequate total reported practices level regarding nursing informatics (Figure 3). This result was agreed with **Farzandipour, et al. (2021)** in Iran who conducted a study entitled “Designing a national model for assessment of nursing informatics competency” (n=200) who found that 62% of student nursing had inadequate nursing informatics practices. From the investigator point view these results explained as because of minority of using the informatics in Egypt they don't have any skills or competencies.

According to research question no. (3) What are nursing students' attitudes toward applications of the nursing informatics system in the community?

The results of the current study demonstrated that more than half of students had negative total attitude toward nursing informatics system (figure 4). This result was agreed with **Ghonem et al. (2023)** in Egypt who conducted a study entitled “Information technology: Nurses' attitudes towards the use of computer and their informatics competences in nursing practice” who founded that 75% of studied nurses had negative attitudes toward nursing informatics. From the investigator point view nursing students don't have knowledge about nursing informatics so their attitude toward nursing informatics system is negative.

The current study revealed that there was highly statically significant positive correlation between the studied nursing students' total knowledge scores and their total attitude scores (table 2). This was in the same line with **Abd Ellatif, (2023)** who revealed that there was highly statically significant relation between the studied nursing students' total knowledge scores and their total attitude scores. These results are inconformity with results of **Ahmed and Bashir, (2021)**, who found that there was no statically significant relation between total knowledge scores and the total attitude scores.



The current study revealed that there was positive highly statically significant correlation between the studied nursing students' total reported practices and their total attitude scores regarding informatics system. These results are in agreement with the findings of **Mohamed and Abouzaied, (2022)** who exhibited statistically significant correlations between the total score of the participants' perception and attitudes of nursing informatics. From the investigator point view, the higher level of knowledge for nursing informatics among students, the greater rate of practice they will have and the more positive attitudes towards this system will be.

5. Conclusion

In light of the current study result and answered the research questions it can be concluded that: Three quarters of nursing students had unsatisfactory level of total knowledge about nursing informatics system. Less than two thirds of nursing students had inadequate total reported practices regarding nursing informatics system. More than half of nursing students had negative total attitude regarding nursing informatics system. There were positive highly statistically significant correlations between total nursing students' knowledge, total reported practices and total attitude regarding informatics system.

6. Recommendations

In the light of the current results, the following recommendations were suggested:

- Applying educational programs for nursing students to improve knowledge, practices and attitude toward nursing informatics.
- Increase awareness about the importance of nursing informatics system.
- Tailored training should be provided for nursing students regarding nursing informatics applications in the community.
- Further research is required for large number of students in different settings regarding nursing informatics.

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