



Nursing Informatics Competencies as Perceived by Nursing Personnel

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Abstract

Background: Nursing informatics competencies crucial competencies required in the contemporary healthcare system. When nurses have an expected level of informatics practice, they will utilizing patient data in way that grantees increase quality maximize outcome, enhance patient satisfaction and promoting evidence-based pract The use of technology and computer systems can facilitate nursing care and support educational resources for nursing studies. **Aim of the study:** This study aims to assess nursing informatics competencies levels as perceived by nursing personnel. **Research Design:** A descriptive research design was utilized to conduct the study. **Setting:** The study was conducted at badr university hospital, which is affiliated to Helwan University and localized on the region of Badr City, Cairo, Egypt. **Subjects:** The study subjects included nursing personnel in Badr hospital (N=120). **Tools of Data Collection:** one tool was used for data collection: informatics competencies questionnaire. **Results:** The study results revealed that more than two-thirds of the studied nursing personnel have a competent level of informatics competencies regarding innovator level. While the minority of them have in-competent level. **Conclusion:** This study concluded that the studied nursing informatics competencies levels are the beginning level gained the higher weight mean (2.61 ± 0.49) and ranked as the first dimensions of informatics competencies. While the innovator level gained the lower weight mean (2.43 ± 0.62) and ranked as the last dimensions of informatics competencies. In addition to the presence of a highly statistically significant difference between the total mean scores of different dimensions of informatics competencies, at $P = 0.000$. **Recommendations:** This study recommended that perform training program to enhance perception of the staff toward nursing informatics competencies, Provide complementary human relations between staff nurses and technology.

Keywords: *Nursing informatics, competencies and Nursing personnel.*

Introduction

Nursing informatics is a product of combination of computer, information and nursing sciences. It has emerged to assist in the management and processing of nursing data, information, and knowledge to support nursing practice, education, research, and administration. Information intensive disciplines like nursing require careful investigation into the application of computers to process nursing information. As the use of information technology further developed in nursing (Amar, & Juneja, 2021). Informatics competency has become an essential requirement for nurses to fulfill their professional roles. This study examined the factors affecting informatics competency to help develop strategies to improve nurses' informatics practice. Establishing a baseline of informatics competencies in nursing students is vital to planning an informatics curriculum and adequately preparing students to use information technologies to promote safe and evidence-based nursing care (Arora, & Gambardella, 2022).



Furthermore, education, research, and practice pave the way for the health care future and prepare individuals for all roles and different settings. Today, informatics is rapidly elevating particularly in nursing, and allied health on our healthcare system. It has evolved into a critical component of the infrastructure for enhancing access to health information, providing safer patient care, lowering costs in healthcare, and advancing patient outcomes and recovery. In all roles and contexts, healthcare stakeholders, such as physicians, nurses, patients, other healthcare workers, and stakeholders, benefited from health informatics decision-making support (*Yassin, &Ghalib, 2023*).

Nursing informatics gained recognition as a nursing specialty, the Council of Computer Applications in Nursing of the American Nurses Association (ANA) provided a new definition for the field. The ANA expanded the previous definitions by incorporating the role of the informatics nurse specialist into the definition of nursing informatics as a specialty that integrates nursing science, computer science, and information science in identifying, collecting, processing, and managing data and information to support nursing practice, administration, education, and research (*Yesil , & Buyukbese , 2024*).

Significance of the study:

The study of nursing informatics competencies is one of the important topics in the health sector, although the nursing informatics is relatively new specialty in nursing field, but it has been proven that it contributed in the nursing practice, research, education and administration. Nursing informatics is serve as a tool to provide high quality and safety patient care , enabling the organization to translate data into meaningful knowledge which in turn helping in increase efficiently and effectively of healthcare services and thus reflected in the overall organization outcome Based on The Study by (*Ward& Kerry, 2023*).

Competency is a series of knowledge, abilities, skills, experiences and behaviors, which leads to the effective performance of individual's activities. Competency is measurable and could be developed through training. It is also breakable into the smaller criteria. Competency is also used as a more general description of the requirements of human beings in organizations and communities. If someone is able to do required tasks at the target level of proficiency, they are "competent" in that area (*Van Zee, A., 2022*).

Nursing informatics is a new specialty in Egypt. It is becoming an important and integral part of healthcare organizations, it affects nursing outcome and quality of health care. Therefore, involving informatics basic knowledge and skills within a nursing education program is recommended to meet the future challenging trends that globally affect nursing work force (*Takuechi & Geo, 2022*). Conducted a study Self-assessment of nursing informatics competencies and attitudes among baccalaureate-nursing students by (*Lobna Khamis, 2021*) that 70.5% of participants assessed themselves as competent, 21% of them were beginners, and only 8.5% of them were novices in the nursing informatics competencies, as well as the majority of them hold positive attitudes toward using of nursing informatics in the healthcare system and the nursing profession.

Aim of the current study:

This study aims to assess nursing informatics competencies levels as perceived by nursing personnel.

Research Question:

What are nursing informatics competencies levels as perceived by nursing personnel?

I- Technical Item:

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

Research Design:

A descriptive research design was utilized to conduct the study.

Research Setting:

The study was conducted in all departments at Badr University Hospital, which is affiliated to Helwan University and localized on the region of Badr City, Cairo, Egypt. Furthermore, the bed capacity of the university hospital is (120 beds). This hospital consists of one building containing two floors, the first floor consisting of (3) operating rooms and a kidney unit consisting of 10-12 machines, a room consisting of incubators for newborn children and blood bank department. Optical binocular unit for the upper and lower gastrointestinal tract and respiratory endoscopy and emergency department; there was room (1) for triage patients and there (2) bed, room (2) for males observation find there (3) beds, room (3) for females observation find there (3) beds, room for surgery find there (3) beds, room for resuscitation (2) bed beside the emergency radiology department consisting of (2) room for X-ray and CT scan, in addition to, surgical department for emergency consists of (3) rooms, the nursing office and the kitchen.

The second floor consists of operational department; included (4) rooms for all types of surgery, (4) beds for recovery, sterilization and inpatient department; there are (40) beds, intensive care unit; there are (6) beds and (1) isolated bed, cardiac care unit; there are (3) beds, catheterization department; there are (3) beds, human resources management department, the director office and classrooms for training medical students and to occur the scientific events.

Research Subjects

A convenience sample of nursing personnel who were available in the previously mentioned hospital at the time of data collection. Whereas, the hospital has a capacity of (n=120) nursing personnel who were available and agreed to participate in the study from the beginning of November 2023 to the end of December 2023.

The Tool (I) Nursing Informatics Competencies questionnaire.

This tool was adapted from (Staggers et al., 2001) and it consisted of two parts:

Part 1: Personal characteristics:

This scale included personal data of nurses (Age, Gender, years of Experience, Educational level in nursing, Work unit, Marital status).

Part 2: nursing informatics competencies questionnaire:

This part includes (100) items verified on three dimensions as computer skills (30 item), Informatics knowledge (35 item), Informatics skills (35 item) assess to informatics competencies Nurses at Four Levels of Practice (Beginning Nurse, Experienced Nurse, Informatics Specialist and Informatics Innovator).

1- Scoring system: This tool consisted of (100 items) with a total grade (300). They used a 3-point Likert scale that rating the studied nursing personnel responses as (1) disagree, (2) neutral, (3) agree.

Total score = 100 items × 3 likert scale = 300

It classified into two levels:

- In competent level: if the total score was less than 75%, it means less than 225 points.



- Competent level: if the total score was equal or more 75%, it means equal or more than 225 point.

Validity of the tools:

Reliability of the tools:

Cronbachs alpha is commonly used as a measure of the internal consistency (reliability). The coefficient normally ranged between 0 and 1. The closer it is to 1.0, the greater internal consistency of the items in the scale. Nunn lay (1978) has indicated (0.7) to be an acceptable reliability coefficient but lower coefficient (0.6) are sometimes used in literature.

Ethical Considerations:

Prior to study conduction, an approval was obtained from the scientific research ethical committee in faculty of nursing- Helwan University, in addition to an approval was obtained from the director of Badr University Hospital either medical or nursing for data collection. Participation in the study is voluntary and subjects were given full information about the study to assess nursing informatics competencies levels as perceived by nursing personnel. They were assured that anonymity and confidentiality of their information would be guaranteed and were informed about their role before signing the informed consent. The ethical considerations included explaining the purpose and the nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it won't be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs were respected.

II. Operational Design:

It includes the preparatory phase, pilot study and fieldwork.

Preparatory phase:

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

Pilot study:

After reviewing of the tools by the experts, the researcher conducted a pilot study to ascertain the clarity, relevance and applicability of the study tools and to determine obstacles that might be encountered during data collection. It also helped to estimate the time needed to fill out questionnaire sheets as following, the first tool was ranged between (10-20 min). The pilot study was carried out on (10%) of the total sample size equal (12) nurses, rephrasing of some questions was done to ensure clarity of the questions and to be easily understood by nurses. However, it helps in estimation of the time needed to collect data and determine the obstacles. no modifications were done and nursing personnel participating in it were included in the total study samples.

Field work:

The purpose of the study was simply explained to the participants who agree to participate in the study prior to any data collection. field work started actually at the beginning of data collection of the study was started at the beginning of November 2023 to the end of December 2023. After obtaining all official permissions the researcher met the director of Badr university hospital to explain the aim of the study to gain the approval of data collection.

The researcher collected data by herself through meeting nurses and explaining the purpose of the study to them in the study setting. The questionnaires sheets were completed by nurses. The

researcher went to Badr university hospital one day per week and was present during fulfilling the questionnaires to answer any question related to the study. The time needed by nurses to complete both of the study tools was ranged between (15-20) minutes. The researcher checked the completeness of each filled sheet after the nurses completed it to ensure the absence of any missing data.

Administrative design:

To carry out the study, official letters issued from the Dean faculty of nursing - Helwan University explaining the aim of the study to the medical and nursing director of Nursing Badr university hospital for obtaining the permission for data collection. Individual oral consent also was obtained from each nurse participated in the study.

IV-Statistical design:

Data entry and analysis were performed using SPSS statistical package version 26. Categorical variables were expressed as number and percentage while continuous variables were expressed as (mean ±SD). Weigh mean used to rank dimensions of informatics competencies when their total score being not equal. Chi-Square (x2) in one sample used to compare differences between levels of informatics competencies among the studied nursing personnel. Crosstab Chi-Square (x2) was used to test the association between row and column variable of qualitative data .

ANOVA test was used to compare mean in normally distributed quantitative variables at more than two groups. Pearson correlation was done to measure correlation between quantitative variables. For all tests, a two-tailed p-value ≤ 0.05 was considered statistically significant, P-value ≤ 0.01 was considered highly statistically significant. While p-value> 0.05 was considered not significant. Additionally, Interval length of weight mean (3 Likert scale).

Results

Table (1): Frequency distribution of the studied nursing personnel characteristic (n=120)

Personal characteristic		No	%
Job title	▪ Staff nurse	99	82.5
	▪ Head nurse	21	17.5
Working unit	▪ In-patient	39	32.5
	▪ ICU	36	30.0
	▪ Dialysis	13	10.8
	▪ ER	9	7.5
	▪ Outpatient	9	7.5
	▪ OR	13	10.8
	▪ NICU	1	0.8
Educational level	▪ Diploma of Nursing	10	8.3
	▪ Technical	61	50.8
	▪ Bachelor degree of Nursing	49	40.8

Years of Experience in nursing	▪ < 1 years	52	43.3
	▪ 1 < 5 year	54	45.0
	▪ 5 < 12 year	9	7.5
	▪ ≥ 12 years.	5	4.2
	▪ Mean ± SD	3.48 ± 3.37	
Age	▪ < 25 Yrs.	74	21.7
	▪ 25 < 35 Yrs.	42	35.0
	▪ 35 < 45 Yrs.	4	3.3
	▪ Mean ± SD	26.36 ± 5.54	
Gender	▪ Male	67	55.8
	▪ Female	53	44.2
Marital status	▪ Single	76	63.3
	▪ Married	43	35.8
	▪ Divorced	1	0.8

Table (1) shows that more than four-fifths (**82.5%**) of the studied nursing personnel were staff nurse. Additionally, more than one-third (**32.5%**) of them were working at in-patient department while the minority (**0.8%**) of them were working at NICU department respectively. Moreover, more than half (**50.8%**) of the studied nursing personnel were holding a certificate of a Technical Institute of nursing. Considering, years of experience, more than two-fifth (**45%**) of them had experience lasting 1 < 5 years with a total mean of **3.48 ± 3.37**. Finally, more than one-third (**35% & 35.8%**) of the age of the studied nursing personnel was ranged from 25 < 35 years old, with a mean age of **26.36 ± 5.54** and were married respectively.

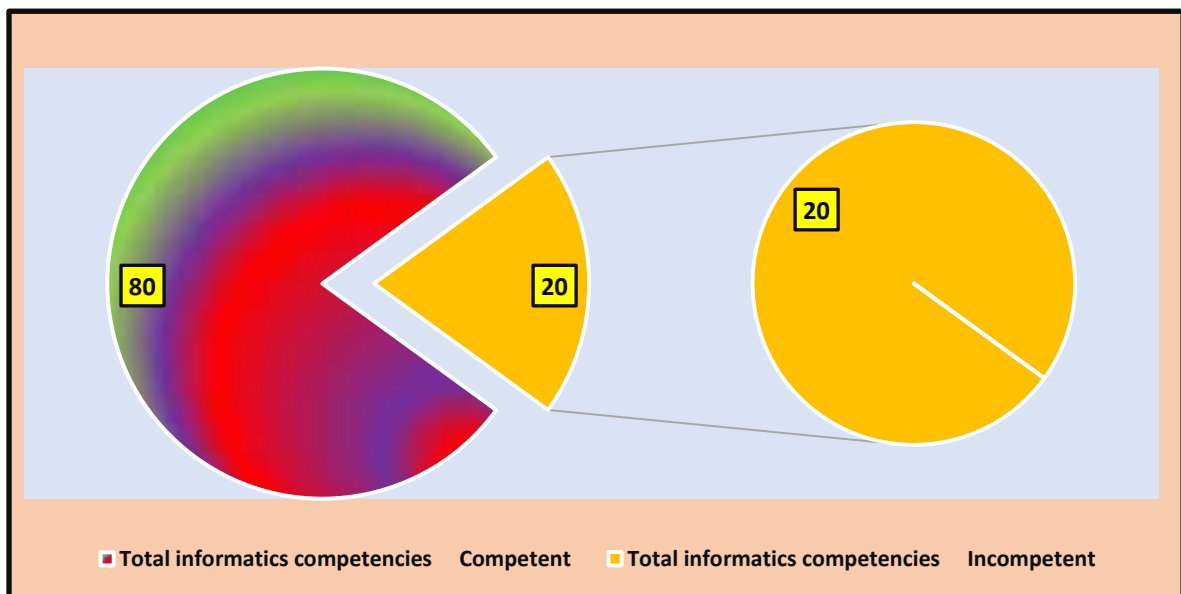


Figure (1): Percentage distribution of total **informatics competencies** among the studied nursing personnel (n= 120)

Figure (1) illustrates that four-fifths (80%) of the studied nursing personnel have a competent level of informatics competencies. While the minority (20%) of them have in-competent level.

Table (2): Total mean score of total informatics competencies among the studied nursing personnel (n= 120).

Informatic competencies	Min	Max	$\bar{x} \pm SD$	$\bar{x}_w \pm SD$	Degree	Rank	F Test	P value
Beginning level	31	93	81.18 ± 15.2	2.61 ± 0.49	3	1 st	755	0.000 ^{***}
Experience level	25	75	64.22 ± 13.0	2.56 ± 0.52	3	3 rd		
Specialized level	37	111	95.74 ± 17.9	2.58 ± 0.48	3	2 nd		
Innovator level	7	21	17.03 ± 4.38	2.43 ± 0.62	3	4 th		
Total	100	300	258 ± 46.7	2.55 ± 0.47	3	-	-	-

*Significant $p \leq 0.05$

F: ANOVA Test

**Highly significant $p \leq 0.01$

1: Disagree

2: Neutral

3: agree

Table (2): represents that the total mean score of informatics competencies among the studied nursing personnel is $\bar{x} \pm SD = 258 \pm 46.7$ (total score is 300). Additionally, the beginning level gained the higher weight mean (2.61 ± 0.49) and ranked as the first dimensions of informatics competencies. While the innovator level gained the lower weight mean (2.43 ± 0.62) and ranked as the last dimensions of tenciesinformatics compe.

In addition to the presence of a highly statistically significant difference between the total mean scores of different dimensions of informatics competencies, at $P = 0.000$.

Table (3): Crosstab association between total **informatics competencies** and the studied nursing personnel characteristics (n= 120)

Personal characteristic	No.	Incompetent		Competent		χ^2	P-Value	
		24	20.0	96	80.0			
Job title	▪ Staff nurse	99	23	19.2	76	63.3	3.69	0.055*
	▪ Head nurse	21	1	0.8	20	16.7		
Working unit	▪ In-patient	39	12	10.0	27	22.5	8.79	0.185
	▪ ICU	36	7	5.8	29	24.2		
	▪ Dialysis	13	1	0.8	12	10.0		
	▪ ER	9	0	0.0	9	7.5		
	▪ Outpatient	9	3	2.5	6	5.0		
	▪ OR	13	1	0.8	12	10.0		
	▪ NICU	1	0	0.0	1	0.8		
Educational level	▪ Diploma	10	3	2.5	7	5.8	13.1	0.001 ^{**}
	▪ Technical	61	19	15.8	42	35.0		
	▪ Bachelor	49	2	1.7	47	39.2		
Years of Experience in	▪ < 1 years	52	23	19.2	29	24.2	33.6	0.000 ^{**}
	▪ 1 < 5 year	54	1	0.8	53	44.2		

nursing	▪ 5 < 12 year	9	0	0.0	9	7.5		
	▪ ≥ 12 years.	5	0	0.0	5	4.2		
Age	▪ < 25 Yrs.	74	21	17.5	53	44.2	8.58	0.014**
	▪ 25 < 35 Yrs.	42	3	2.5	39	32.5		
	▪ 35 < 45 Yrs.	4	0	0.0	4	3.3		
Gender	▪ Male	67	6	5.0	61	50.8	11.5	0.001**
	▪ Female	53	18	15.0	35	29.2		
Marital status	▪ Single	76	16	13.3	60	50.0	4.42	0.109
	▪ Married	43	7	5.8	36	30.0		
	▪ Divorced	1	1	0.8	0	0.0		

*Significant $p \leq 0.05$

**Highly significant $p \leq 0.01$

Table (3): represents that, there was a highly statistically significant relation between personnel characteristics (job title, educational level, years of experience in nursing, age and gender) and total level of competencies informatics among the studied nursing personnel, at $P = \leq 0.05$.

Table (4): Correlation between total **informatics competencies** and it's dimension among the studied nursing personnel (n= 120)

Items	Total informatics competencies	
	r	P
Beginning level	0.924	0.000**
Experience level	0.954	0.000**
Specialized level	0.941	0.000**
Innovator level	0.759	0.000**

*Significant $p \leq 0.05$

**Highly significant $p \leq 0.01$

Table (4): represents that there was a highly statistically significant positive strong correlation between total informatics competencies and its dimension (Beginning level, experience level, specialized level & innovator level) among the studied nursing personnel, at r ranged from (0.759 to 0.954 & $P = 0.000$).

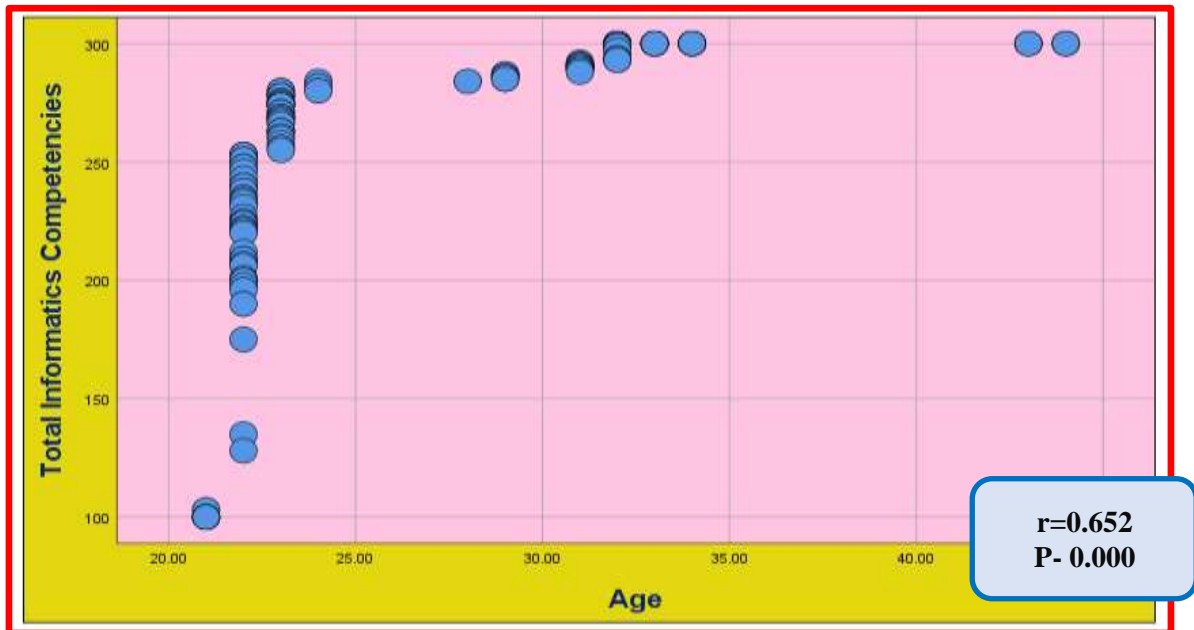


Figure (3): Correlation between total **informatics competencies** and age among the studied nursing personnel (n= 120)

Figure (3): represents that there was a moderate statistically significant positive strong correlation between total competencies informatics and the studied nursing personnel's age , at $r = 0.652$ & $P = 0.000$.

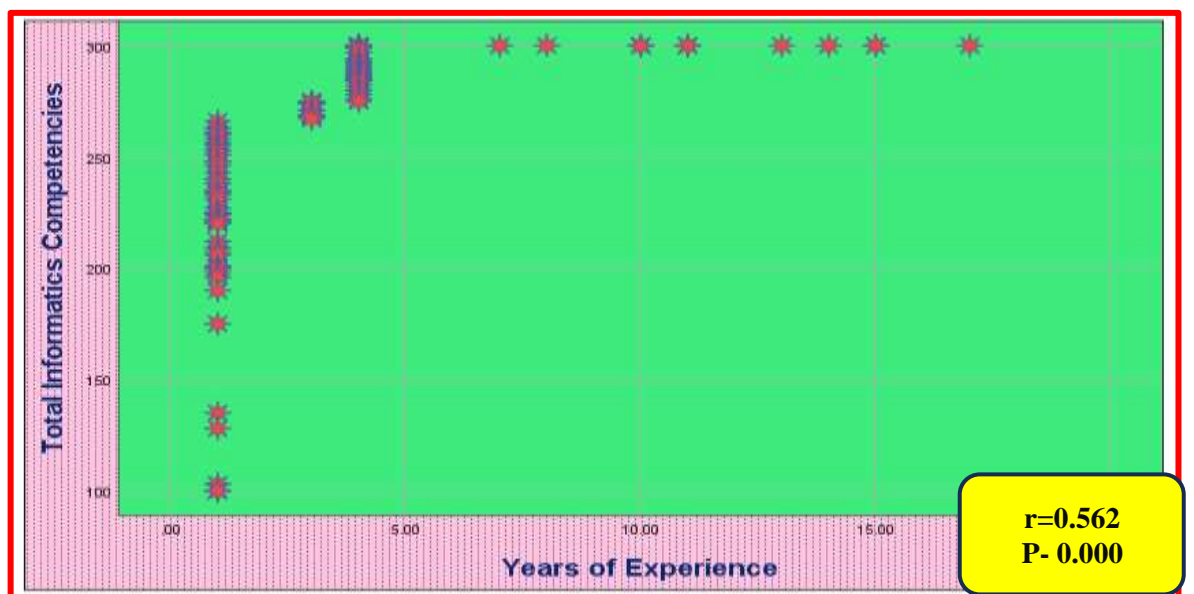


Figure (4): Correlation between total **informatics competencies** and years of experience among the studied nursing personnel (n= 120)

Figure (4): represents that there was a moderate statistically significant positive strong correlation between total informatics competencies and the studied nursing personnel's years of experience , at $r = 0.562$ & $P = 0.000$.



Discussion

As regard to personal characteristics of the studied nurses, shows that more than four-fifths (82.5%) of the studied nursing personnel were staff nurse. Additionally, more than one-third (32.5%) of them were working at in-patient department while the minority (0.8%) of them were working at NICU department respectively. Moreover, more than half (50.8%) of the studied nursing personnel were holding a certificate of a Technical Institute of nursing. Considering, years of experience, more than two-fifth (45%) of them had experience lasting $1 < 5$ years with a total mean of 3.48 ± 3.37 . Finally, more than one-third (35% & 35.8%) of the age of the studied nursing personnel was ranged from $25 < 35$ years old, with a mean age of 26.36 ± 5.54 and were married respectively .

From the researcher point of view this result might be due to the more than four-fifths of nurses were staff nurse and its cause of this they are graduated from technical institute so more than one-third (35% & 35.8%) of the age of the studied nursing personnel was ranged from $25 < 35$ years old, and the most nurses work in inpatient ward in the hospital because of ministerial assignment to the hospital, regarding to years of experience that because the nurses are graduated from technical institute, regarding the marital status the most of nurses are married because they are already at the mid of thirties, regarding the income all of nurses have the same salary because they are have almost the same years of experience .

This outcome matched with study by Dietz, Graham & Hartog, Deanne N. Den ., (2022), who conducted study entitled "Is There a Difference Between The nursing informatics competencies and quality of care of and revealed that more than half of the studied nurses were married and had Technical Institute of nursing .

Moreover as recommended by Ehnfors and Grobe, (2021) educational strategies must be linked with the intended competencies. Consequently, it is essential to integrate routine measurement of informatics competency into the curriculum so that approaches can be ensure of the age of the studied nursing personnel was ranged from $25 < 35$ years old.

On other hand, this result dissimilarity with Hassan zadeh ., (2023), who conducted study about nursing informatics competencies regarding organizational productivity reported that the highest percentage of the studied nurses were females, have diploma of secondary technical school, their age less than 30 years old. Also, the highest percentage of them were single.

Illustrates that four-fifths (80%) of the studied nursing personnel have a competent level of informatics competencies. While the minority (20%) of them have in-competent level. In addition to the presence of a highly statistically significant difference between levels of informatics competencies at $P = 0.000$. From researcher point view, this result might be due to staff nurses had a lot in common and more shared involvements and experiences with their unit managers and supervisors in the current working units, that resulted in positive interaction in the advanced technology so nursing personnel have a competent level of informatics competencies .

Matched with the study of Arabi, S., (2022), Identifying information technology competencies needed in Singapore nursing education majority of the studied nursing personnel have a competent level of informatics competencies. While the minority of them have in-competent level. In addition to the presence of a highly statistically significant difference between levels of informatics competencies .

On other hand, this finding contradictory with Ali et al., (2023). The study findings indicated that more than two-thirds of the nurses felt that they did not have sufficient informatics competency.



This indicated that knowledge and skills on overall informatics content needs to be raised through academic or clinical educational programs.

Represents that the total mean score of informatics competencies among the studied nursing personnel is $\bar{x} \pm SD = 258 \pm 46.7$ (total score is 300). Additionally, the beginning level gained the higher weight mean (2.61 ± 0.49) and ranked as the first dimensions of informatics competencies. While the innovator level gained the lower weight mean (2.43 ± 0.62) and ranked as the last dimensions of informatics competencies. In addition to the presence of a highly statistically significant difference between the total mean scores of different dimensions of informatics competencies at $P = 0.000$.

From researcher point view, this result might be due to use the technology and information management recently so they are learning to increase their experience.

This outcome harmony with study by Abdel Nasser et al., (2021). Nursing and the informatics revolution the presence of a highly statistically significant difference between the total mean scores of different dimensions of informatics competencies . On the other hand, as a result of the research by Polat S., (2022), Health Insurance Review Agency, Korean Society of Medical Informatics. Current Status of the Implementation of Computerized Information Systems in Health Care Organizations. the presence of a low statistically significant difference between the total mean scores of different dimensions of informatics competencies.

Represents that there was a moderate statistically significant positive strong correlation between total informatics competencies and the studied nursing personnel's age , at $r = 0.652$ & $P = 0.000$.

This outcome agreement with study by A. Tanner, S. Pierce, (2023), Readiness for evidence-based practice: information literacy needs of nurses there was a moderate statistically significant positive strong correlation between total informatics competencies and the studied nursing personnel's age , at $r = 0.652$ & $P = 0.000$.

On other hand, this result disagreement with study D.L. Sackett, W.S. Richardson, (2023), Evidenced-based medicine: how to practice." and reported that there was a highly statistically significant positive strong correlation between total informatics competencies and the studied nursing personnel's age , at $r = 0.652$ & $P = 0.000$.

Represents that there was a moderate statistically significant positive strong correlation between total informatics competencies and the studied nursing personnel's years of experience , at $r = 0.562$ & $P = 0.000$.

From the researcher point of view, this result might be due to nurse leaders have the highest level of informatics competencies and the studied nursing personnel's years of experience that related to increase the experience during increase the years of work and practices regarding computer skills.

This outcome in same line with study by Saranto, E. Hovenga,(2021) Information literacy—what is it about? Literature review of the concept and the context " and showed that there was a moderate statistically significant positive strong correlation between total informatics competencies and the studied nursing personnel's years of experience.

On the other hand of the study by Barton, D. Skiba, L. Sorensen,(2022) Preparing the next generation of advanced practice nurses, On the opposite way according to this study by Ehnfors, S. Grobe,(2023) Nursing curriculum and continuing education, they found that that there was a low statistically significant positive strong correlation between total informatics competencies and the studied nursing personnel's years of experience.



Conclusion

On the light of the findings of the current study, it can be concluded that:

This study concluded that the studied nursing personnel have a competent level of informatics competencies regarding the beginning level gained the higher weight mean (2.61 ± 0.49) and ranked as the first dimensions of informatics competencies. While the innovator level gained the lower weight mean (2.43 ± 0.62) and ranked as the last dimensions of informatics competencies. In addition to the presence of a highly statistically significant difference between the total mean scores of different dimensions of informatics competencies, at $P = 0.000$.

Acknowledgment

The authors thanks all the nursing personnel who participated in this study.

Recommendations

Based on the current study the following recommendations suggested that:

At the organizational level

- Enhance concept about informatics competencies for the innovation in hospital activities.
- Maintain resources for development of the staff practices to achieve professionalism.
- Develop continuously the culture of transparency and open communications for new staff toward technology.
- Stability of healthy workplace for nurses to Maintain organizational engagement.

At nursing personal level

- Conduct self-learning continuously to improve staff performance, skills and creative thinking.
- Conduct self-learning continuously to improve nursing informatics competencies, skills.
- Train on good division of work into small groups to perform tasks.
- Provide complementary human relations between staff nurses to learn each other toward informatics competencies.
- Build team Cohesion and conflict resolution practice.

At further research

- Replicate the study on many of hospitals with large sample sizes for generalize the study findings.
- Determine the relationship between nursing informatics competencies and job satisfaction.
- Determine the relationship between nursing informatics competencies and organizational productivity.
- Assess the effect of nursing informatics competencies on staff performance.
- Examine challenges of nursing informatics competencies in nursing field.

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