



Proposed A Job Description for Nurses Using Health Information Systems

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ABSTRACT

A health information system (HIS) is a comprehensive, integrated and specialized system that manages both administrative and clinical aspects of hospitals and healthcare information facilities. **Aim:** Proposed a job description model for nurses who use hospital information systems. **Study subjects:** All available ICU nurses at Al-Rajhy Hospital who are using HIS (no = 26). **Study tools:** Three tools were used, namely, personal data sheet, diary and observational performance checklist. **Result:** The majority of the nurses in the study recorded vital signs, assessed the patient's condition, made beds, and documented patient data electronically. **Conclusion:** The majority of the subject is responsible for all aspects of attendance and punctuality, appearance, work habits, staff relations and communications with patients, nursing care plan activities, material planning, safety measures and patient safety, documentation electronically, coordination, and staying technically up to date. **Recommendation:** A job description should be added to the HIS user manual and distributed widely to support the nursing staff. Continuing training workshops for new HIS users should be established to improve their computer skills.

Keywords: Health information system, Job description, Nursing informatics.

Introduction

Technology has advanced rapidly over the last 40 years and has become an integral part of healthcare (Maryniak, 2016). The health information system (HIS) is a comprehensive, integrated, and specialized information system designed to manage both the administrative and clinical

aspects of hospitals and medical facilities. It is considered to be one of the most important focal points of healthcare (Khalifa, 2017). Health information technology is used to improve the quality, safety, and efficiency of medical care. Improved communication between healthcare providers and patients, automation of clinical

information, reduction of errors, and facilitation of evidence-based practices are all part of this transformation (Maryniak, 2016). According to the American Nursing Association, Nursing Informatics (NI) integrates nursing science with multiple information management and analytical sciences to identify, define, manage and communicate data, information, knowledge, and wisdom in nursing practice (ANA, 2015). To face the explosive growth of advanced computer technology in the workplace, it is imperative that nurses be prepared for computerization. In the highly competitive healthcare market, it is important to prepare caregivers to use the most cost-effective methods (Malar, 2014). NI helps nurses, consumers, patients, the inter-expert healthcare team, and different stakeholders of their decision-making in all roles and settings to reap preferred outcomes. This help is done through the usage of structures, processes, and technology” (ANA, 2015). The competency of nursing informatics professionals is determined by reading three classes: computer capabilities, which include automatic searches and retrieving patient demographics information, as well as the documentation of patient care; informatics expertise, which includes the popularity of the use or significance of nursing data for improving exercise; and informatics capability talents, which includes the translation of statistics float in the organization. It investigates four levels of nursing practice: beginner nurse, experienced nurse, informatics specialist, and informatics innovator (Darvish, 2014). **Significance of the study** There is a shortage of nurse informatics qualifications

due to the large number of nursing graduates working as nursing care providers, and in light of hospitals adopting the use of documentation on healthcare information systems, which requires that nurses hone these skills and build their tasks and responsibilities towards documenting nursing care electronically. There are two studies conducted in Al-Rajhy Assiut Hospital related to HIS. The first one was conducted by **Mohamed H. (2016)**. This study showed that study participants had adequate understanding soon after the training program’s content was implemented. The second one was conducted by **Mohamed S. (2020)**. This study revealed that the majority of the participants in the study were satisfied with the use of electronic health information system, and the majority of them stated that there is no manual or guidelines for using HIS records. So, the researchers identified a pressing need for study to examine the responsibilities of the nurses who use the nursing informatics system and identify such tasks in the form of a job description.

Aim of the study

- Proposed a job description for nurses who use hospital information systems.

Research questions

- What are the activities that are performed by nurses using health information systems?
- What are the duties and responsibilities of nurses who use hospital information systems?

Subject and Method

1. Technical design

It includes the research design, the study setting, subjects, and data collection tools.

1.1) Study Design

The present study was a descriptive analytical study.

1.2) Setting

The present study was conducted at ICU in Al-Rajhy Liver Assiut University Hospital with a bed capacity of 200 beds; this hospital serves all Upper Egypt population.

1.3) Subject

The participants in this study include all available ICU nurses who use the health information system (HIS) in Al-Rajhy (no = 26).

1.4) Data collection tools

The following are three tools that were used in this study:

Tool (1): Personal data sheet for nurses that includes age, educational qualification, job title, experience of nurses for using HIS, suitable no. of beds for nurses using HIS, who are responsible to record in HIS, who are responsible supervise nurses record in HIS, years of experience in the department and training courses attended.

Tool (2): Diary

A diary is a narrative description of nursing activities performed by nurses using the health information system. It was used to identify their duties and responsibilities.

Tool (3): Observational performance checklist

This tool was filled by the researcher in order to identify and analyze job activities performed by nurses using the health information system that was adapted from **Youssif et al. (2017)**. It contains 77 items grouped into eleven main categories as follows: -Attendance and commitment to official

times (3 items). Appearance (4 items).-Work habits (8 items).Relationship and communication with the health team (6 items).Communication with patients (7 items). Activities of nursing care plan (30 items).Planning resources (1 item).Safety precautions and patient safety (6 items).HIS documentation (7 items).Coordination (1 item).Keeping up to date (5 items).

Scoring system

- Items rating from 1 to 3 for done and from 1 to 3 for not done, because the researcher observe nurses activities for three times.
- Items rating from (1) for done and (0) for not done and then calculate mean of three times

2. Administrative design

An official approval was obtained from the Dean of Assiut University Nursing College, as well as the Director of Nursing at Al-Rajhy Liver Assiut University Hospital to collect the necessary data.

2.1) Ethical Considerations

The Ethical Committee at the Faculty of Nursing in Assiut University approved the research proposal. There is no risk to study participants during the implementation of the research. The study follows common ethical principles in clinical research. Oral agreement was taken from the participants in the present study. The participants have the right to refuse or to participate and/or withdraw from the study without any rationale at any time. Confidentiality and anonymity was also be assured. The participants' privacy was considered during the collection of data.

3. Operational design

The study was conducted in three main phases: preparatory, implementation, and evaluation phase.

3.1) Preparatory phase

This step included a review of the available literatures concerning the study's topic of the, followed by the Arabic translation of the study tools. The content validity of the study tool (Observational Performance Checklist tool) was reviewed by five experts from Assiut University's Nursing Administration Department, Faculty of Nursing.

3.2) Pilot study

A pilot study was randomly conducted on seven nurses from Al-Rajhy Liver Assiut University Hospital, representing 10% (3 nurses) of the total study participants, to ensure clarity, accessibility, and understandability of the study tool.

Data collected from the pilot study were analyzed, and there were no necessary modifications done for the study tools. This phase took about two weeks in June 2021.

3.3) Field work

The researchers observe each study subject. After obtaining oral consent, The researchers filled out the observation for activity analysis record by intermittently observing and recording activities performed by nurses using health information system with a 15-minute interval for three consecutive working days, covering the six hours of the morning shift from 7:30 A.M to 1:30 P.M to record their actual activities performed. This phase took about 8 months from September 2020 to March 2021. The researchers develop a job

description model for nurses who are using health information system.

The participants were given the study tool (questionnaire) to complete. In order to collect data about nurses who use the health information system, the researchers gave each nurse a paper and a pencil and told them to write down all the activities they perform in sequence for one week, as well as a list of the other activities assigned to them. This phase was carried out in August 2021.

4.) Statistical design

Data entry and analysis were done using SPSS version 20 (Statistical Package) for Social Science. Data were presented using descriptive statistics such as frequencies and percentages, mean, and standard deviations.

The data were collected using the diary and activity analysis observation sheet and were presented using descriptive statistics in the form of frequencies and percentages. Correlation was determined by Pearson's correlation coefficient. Statistical significance was defined as $p < 0.05$.

IV. Results

Table (1): This table shows that about more than two-thirds of the study subjects are staff nurses (76.9%), educated in Technical Institute of Nursing (57.7%), more than half of them are aged between 20 and 30 years old (57.7%), and they have work experience more than five years (57.7%). Moreover, less than three-fourths of them have more than five years of experience in the department. In addition, the majority of them

(89.8%) reported that the head nurse, nurse supervisor, and nurse manager are responsible for supervising nurses who record in HIS.

Table (1 cont.): The majority of the studied nurses report that nurses who are recording on HIS have attended training program about computer programs and electronic recording (84.6%) and they have work experience in using HIS through both education and practice (69.2%).

Table (2): This table shows that vital signs records are used by a large percentage of the studied nurses (88.5%). Conversely, only 19.2% of the nurses studied used progress notes, which is highly statistically significant (0.000**).

Table (3): According to the data recorded in the diary about duties of the studied nurses, the highest percentage of them were responsible for assessing the patient's condition, bed making, measuring and recording of vital signs, and writing patient data (88.5, 88.5, 88.5, and 73.1, respectively), while the lowest percentage of them were responsible for dressing and doing progress notes (7.7 and 19.2, respectively).

Table (4): This table shows that the majority of the studied nurses performed all tasks related to the attendance and punctuality, appearance, work habits, staff relations and communications with patients, nursing care plan activities, material planning, safety measures and patient safety, HIS documentation, coordination, keeping up to date technically, ranging from 61.5 to 84.6.

Table (1): Distribution of personal characteristics for the studied nurses at Al-Rajhy Liver Assiut University Hospital (no = 26)

Personal data	Nurses (n = 26)	
	No.	%
Age (years)		
• 20–30 yrs	16	61.5
• 31 and more	10	38.5
Mean \pm SD	27.38 \pm 0.49	
Educational qualification		
• Secondary school of the Nursing Diploma	8	30.8
• Technical Institute of Nursing	15	57.7
• Bachelor Degree in Nursing	3	11.5
Job title		
• Head nurse	6	23.1
• Staff nurse	20	76.9
Suitable no. of beds for nurses using HIS		
• Less than 2 beds	3	11.5
• 3 and more	23	88.5
Experience of nurses for using HIS through		
• Education	7	26.9
• Practical	18	69.2
• Both of them	1	3.8
Who are responsible to record in HIS		
• Technical nurse	7	26.9
• Staff nurse.	7	26.9
• All of the above	12	46.2
Who are responsible supervise nurses record in HIS		
• Head nurse	1	3.8
• Charge nurse	7	26.9
• Nurse manager	4	15.4
• All of the above	14	53.8

Table (1 cont.): Distribution of personal characteristics for the studied nurses at Al-Rajhy Liver Assiut University Hospital (no = 26)

Personal data	No.	%
Training program attended		
• Computer programs	22	84.6
• Infection control	4	15.4
• English language	3	11.5
Years of experience in the department		
• Less than one year	1	3.8
• 1–5 yrs.	15	57.7
• 6–10yrs.	6	23.1
• More than 10 yrs	4	15.4
Mean \pm SD	2.50 \pm 0.81	
Years of experience in using of health information system		
• Less than one year	8	30.8
• 1–5 yrs.	16	61.5
• 6–10yrs.	1	3.8
• More than 10 years	1	3.8
Mean \pm SD	1.80 \pm 0.69	

Table (2): Types of health information system record and reports used by studied nurses at Al-Rajhy Liver Assiut University Hospital (no = 26)

Types	Mean No. of done	%	p-value
1) Drug administration record	9	34.6	0.003**
2) Vital signs record	23	88.5	0.000**
3) Progress notes	5	19.2	0.000**
4) Blood sugar test record	8	30.7	0.001**
5) Feeding of patient (rile) record	9	34.6	0.002**
6) Changing of position	9	34.6	0.000**

***) Statistically significant at P -value ≤ 0.001

Table (3): Data recorded in the diary about duties of the studied nurses at Al-Rajhy Liver Assiut University Hospital (no = 26)

Activities	Mean No. of done	%
1) Assessment of the patient condition	23	88.5
2) Bed making	23	88.5
3) Writing the patient data	19	73.1
4) Taking blood sample	17	65.4

5) Drug administration	9	34.6
6) Record of vital signs	23	88.5
7) Progress notes	5	19.2
8) Measuring blood sugar	8	30.7
9) Feeding of patient (rile)	9	34.6
10) Dressing	2	7.7
11) Changing of position	9	34.6

Table (4): Data collected using activity analysis observation for activities done among the studied nurses using the health information system at Al-Rajhy Liver Assiut University Hospital (no = 26)

Activities observed	Mean No. of done	%
Attendance and punctuality		
1-Start work on time	19	73.1
2-Not exceed the identified limits of absenteeism	16	61.5
3-Not leave the unit during working hours	19	73.1
Appearance		
4-Wear clean uniform	18	69.2
5-Wear complete uniform	21	80.8
6-Wear neat uniform.	16	61.5
7-Omit jewelries in clinical area	17	65.4
Work habits		
8-Follow the applicable laws, rules, policies, and directives	15	57.7
9-Accept instructions related to his/her work	20	76.9
10-Have obedience and politeness attitude	19	73.1
11-Adheres to work schedules	18	69.2
12-Complete assignments on time	18	69.2
13-Responds to unscheduled requests on a timely basis	17	65.4
14-Is available during crunch times to work extra hours	17	65.4
15-Takes responsibility for his/her own work	16	61.5
Staff relations and communication		
	16	61.5

16-Communicates in a good manner with all staff		
17-Respects all members of the healthcare team	16	61.5
18-Collaborates with his/her colleagues to achieve the unit objectives	20	76.9
19-Follow the ethical guidelines in communicating with the healthcare team	20	76.9
20-Has a positive sharing voice in matters of work unit	18	76.9
21-Providing information to superiors that is complete, reliable, and prompt	18	76.9

Table (4 cont.): Data collected using activity analysis observation for activities done among the studied nurses using the health information system at Al-Rajhy Liver Assiut University Hospital (no = 26)

Activities observed	Mean No. of done	%
Communication with patients	20	76.9
22-Respect the dignity of each patient		
23-Keep confidential information of patients	20	76.9
24-Responds to patient's needs on time	20	76.9
25-Is alert to verbal and nonverbal responses	17	65.4
26-Is calm and gentle during patient care activities	20	76.9
27-Behave ethically and politely with patients	17	65.4
28-Explain the plan of care to patients	20	76.9
Nursing care plan activities		
29-Receive the patient and give immediate care according to his/her	18	69.2

condition and doctor's order		
30-Collect subjective data about the patient	19	73.1
31-Collect objective data about the patient	16	61.5
32-Correctly define nursing diagnosis based on assessment data	14	53.8
33-Set priorities for patient's problems	17	65.4
34-Prescribe suitable intervention clearly	20	76.9
35-Apply preventive measures to prevent hazards according to needs	19	73.1
36-Carry out medical and nursing care plan as prescribed by medical and nursing staff	16	61.5
37-Round with doctors and carry out their instructions	17	65.4
38-Give help for patients and protect them from infection	19	73.1
39-Take laboratory samples for investigations	18	69.2
40-Take and record vital signs and notify for any changes	19	73.1
41-Prepare and give IV solutions and record the amount	18	69.2
42-Give medication	18	69.2
43-Correctly done CPR	18	69.2
44-Check medical equipment in unit frequently	17	65.4
45-Prepare patients before operation and transfer	16	61.5
46-Receive and give shift report	18	69.2
47-Insert and done NGT procedure	15	57.7
48-Insert and done urinary catheter procedure	19	73.1
49-Insert and done cannula procedure	19	73.1
50-Change dressing	18	69.2
51-Done blood transfusion	18	69.2
52-Done ECG	18	69.2
53-Suction from airway	18	69.2
54-Take and care CVP	19	73.1
55-Take arterial blood gases	19	73.1
56-Prevent bedsores	19	73.1
57-Prepare clear discharge plan according to patient's needs	16	61.5

58-Evaluate the patient's response to intervention	14	53.8
Material planning 59-Assessing needs for equipment, materials, and processing.	17	65.4

Table (4 cont.): Data collected using activity analysis observation sheet among the studied nurses using the health information system at Al-Rajhy Liver Assiut University Hospital (no = 26)

Activities observed	Mean No. of done	%
Safety measures and patient safety 60-Wash hands before and after any procedure.	14	53.8
61-Put needed personal protective during patient care activities, e.g.,gloves, masks, etc.	15	57.7
62-Follow safety measures to avoid physical hazards, e.g., raise bedside rails, infection control guidelines.	13	50.0
63-Organizing work site in such a way that it is neat and clear of potential hazards.	15	57.7
64-Follow five rights of medication administration.	14	53.8
65-Seek agreement from patient before any procedure.	11	42.3
HIS documentation 66-Write documents that is concise, organized, easy to read, and written in the electronic format.	15	57.7
67-Document everything on HIS on time.	16	61.5
68-Record clearly current condition of patient on HIS.	17	65.4
69-Record progress in patient condition on HIS.	15	57.7
70-Record all procedures performed on HIS.	18	69.2
71-Providing others with complete and accurate written direction.	17	65.4
Coordination 72-Utilizing available support	16	61.5

services (e.g.,laboratory, laundry, pharmacy) effectively.		
Keeping up to date technically 73-Serving as a "resource person" on whom others rely for technical advice.	16	61.5
74-Skillful in procedures specific to the work area.	19	73.1
75-Knowledgeable about common diseases in his/her work area.	22	84.6
76-Demonstrating effort and success at self-improvement.	22	84.6
77-Striving to achieve objectives beyond what is expected or required.	22	84.6

V. Discussion

Nurses' communicating written or electronic client information to other nurses increases the possibility that the client will receive consistent and informed care or service. Thorough, accurate documentation decreases the potential for miscommunication and errors and provides patient safety in the form of incident reporting (**Randal & Nelson, 2007**).

Based on the results of this study, as regards personal characteristics of the studied nurses, more than half of them were qualified in Technical Institute of Nursing and had experience ranging from 1 to 5 years at Al-Rajhy Liver Assiut University Hospital. This could be due to fact that Al-Rajhy University Hospital had a fully automated e-HIS since its opening in 2012. The implementation of HIS in a hospital is a new system in Assiut University Hospital as a whole and especially in Al-Rajhy Liver Assiut University Hospital, in an attempt to convert the paper-based medical record system to a fully automated electronic record systems. With this, the hospital

hired all nurses from the Technical Institute of Nursing because their educational program included computer courses. These findings matched those of **Hamad et al. (2017)**, who demonstrated the modification of a computerized patient recording system at Al-Rajhy Liver Assiut University Hospital. These are also consistent with those of **The American Nurses Association (2008)**, which stated that “a specialty that integrates nursing science, computer science, and information science to manage and communicate data, information, knowledge, and wisdom in nursing practice.” The findings were also consistent with those of **Keser (2016)**, who reported that technology in nursing education is accepted as the main component of nursing practices and the fact that nurses effectively use technology and have knowledge, skills, and attitudes, which are emphasized as characteristics required in nursing. Nurses are expected to have knowledge, skills, and critical thinking ability.

Meanwhile, **Maryniak (2016)** disagreed with this finding who reported that many educational programs now offer a major in nursing informatics, such as master’s degree level. Some institutions offer a certificate in nursing informatics, which requires a bachelor’s degree. Informatics can be included in programs with one or more courses or can be integrated into the curriculum. Online learning, simulation, and the usage of handheld mobile devices and applications are all becoming more common.

It was clear from the results that the majority of the studied nurses reported that the head nurse in their unit, nurse supervisor, and nurse manager are

responsible for supervising nurses who record in HIS. This finding was supported by **Moghaddasi (2017)** who reported that the availability of information from the level of staff to nursing directors is important. The nursing information system serves as a decision-making tool for head nurses, supervisors, and matrons, as well as having applications in the fields of education and research. Due to the nature of nursing profession, its practical aspects outweigh its cognitive aspects.

The current data show that a large percentage of the studied nurses used various types of hospital electronic records, particularly vital signs recordings. This finding is consistent with **Ryan (2009)** who stated that electronic documentation includes flow sheets that help in the gathering of information about the patient’s needs, increase the accuracy of patient’s information, and improve the quality of patient care.

According to the current findings, the most common duties of the studied nurses were assessing the patient’s condition, bed making, measuring and recording of vital signs, and writing patient data in the diary. This could be related to nurses’ responsibilities to provide all patient care needed and then document this data in the HIS. This finding is consistent with **Lee (2014)**, who stated that nurses use the information, which are obtained from evaluating patient’s healthcare needs, in developing patient care plan and obtaining and sharing patient information with other healthcare professionals. The NIS supports information development supporting all nursing fields and the process. The findings are also

consistent with **Keser (2016)**, who mentioned that nurses who collect data from patients and transfer these data into electronic health records are the most important healthcare team group, providing direct care to patients, determining their needs, and deciding on what materials should be used where and when, as well as being the primary users of the computerized system.

From the current findings, the studied nurses performed their tasks relating to work habits, staff relations and communications with patients, nursing care plan activities, material planning, safety measures and patient safety, documentation, coordination, keeping up to date technically. This finding is consistent with **Baker (2012) and The American Nurses Association (ANA, 2010)**, who recognized nursing informatics as a specialty, which includes demonstrating a distinguished practice base, identifying educational programs, and supporting from nationally recognized organizations, with the increased recognition and educational programs focused on nursing informatics.

Additionally, **CMS (2010 & 2012)** stated that components of meaningful use through the EHR include computerized physician's order entry, patient demographics, vital signs, medication reconciliation, drug interactions, allergies, smoking status, clinical decision support, interdisciplinary communications, advance directives, confidentiality, transitions of care, patient education, and ability of patients to obtain a copy of their EHR. **HIMSS (2011)** also stated that as the criteria of meaningful use evolve,

nurses must be involved as key stakeholders in the planning, design, implementation, evaluation, and optimization of health IT.

VI. Conclusion

A large percentage of the studied nurses used various types of hospital electronic records, particularly vital signs recordings. The data recorded in the diary about duties of the studied nurses illustrated that the highest percentage were assessment the patient's condition, bed making, measuring and recording of vital signs, and writing patient data. The majority of the studied nurses performed all tasks related to staff relations, communications with patients, nursing care plan activities, material planning, safety measures and patient safety, electronic documentation, coordination and keeping up to date technically in addition to their attendance, punctuality, appearance, and work habits.

VII. Recommendations

- Orient and train nurses who used HIS about the updated job description
- Take legislative steps to update nurse's job description to involve HIS job description model for HIS Nurses to add to the manual and distributed widely to support the nursing staff.
- Add a topic of health information system in the undergraduate curriculum of the different nursing levels.
- Increase support for roles such as chief nursing information officers or other types of field informatics specialists at organizational/country levels.

- Initiation of HIS in every healthcare setting.
- Create a formal linkage among healthcare team using HIS and clarify to them policy to them.

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