Arab American University

Faculty of Graduate Studies

The effect of health informatics and computer system on patient medication safety at Palestinian Hospitals

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This thesis was submitted in partial fulfillment of the requirements for the Master's degree in Health Informatics

2022

Thesis Approval

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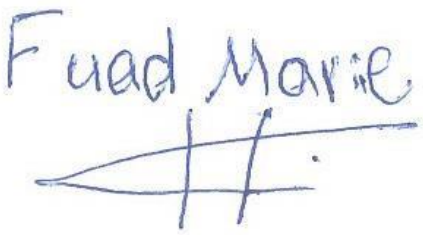
Declaration

This thesis was submitted in partial fulfillment of the requirement for Master's degree in Health Informatics.

I declare that the content of this thesis whole or any part of the same has not been submitted before in order to qualify for any other academic degree for any other university or institution. All the ethics transactions and guidelines have been followed duly while establishing the thesis. Student's Name: Fuad Sa'ed Ahmed Marei

Date: 18/5/2022

Sig: 

23/08/2022

Dedication

To the person who gave me giving, strength and pride... my dear father

To the person who gave me love, tenderness, tenderness and loyalty .... my dear mother.

To my bond, my consolation, my joy and my honor... my dear brothers.

To the liver of the joy of my life.... my sisters and my brothers To the symbol of loyalty and giving.... my Heart.

To all my friends and relatives, I dedicate to you my scientific research in...

I hope, in the end, from God to make luxury for everyone and for those who helped us to finish this project.

Amen……!

Fuad Sa’ed Ahmed Marei

Acknowledgements

To the light God guided us the way.

This research paper has been made possible with the help of, my dear parents and friends, and in essence, my dearly beloved little sister who has been an inspiration to me and my brothers, may God have mercy on them in particular, allow us to dedicate our appreciation of gratitude to the following important advisors and contributors.

First of all, we would like to thank Dr. Imad Abu Khader for his support and encouragement to me. Read my article and it gave invaluable detailed advice on the rules, organization, and topic of the paper, and to reprimand the paper as well.

Secondly, I would like to thank Dr. Nisreen Salama for taking the time to read our thesis and provide valuable advice.

Finally, I need to thank all for help me to end this thesis.

Fuad Sa’ed Ahmed Marei

Abstract

Background: There is a large and rapid development in health informatics with varying degrees of evidence about its impact on patient safety. The health system in Palestine partially lacks patient safety.

Aim: This study was conducted to investigate the effects of computerized health information systems on patient safety from and the study also explored the perceived obstacles of using the computerized health information system from the viewpoint of nurses.

Methods: A descriptive, quantitative, Cross-sectional approach was used to test hypotheses and examine the association between variables. The cross-sectional part of this study was conducted using a self-administered questionnaire, and use part involved interviews for Nursing manager in Hospitals. The study participants were recruited from different hospitals across the north West Bank of Palestine.

Results: A total of 155 nurses participated in this study. 78 (50.3%) were female and 101 (65.2%) were 30 years and younger. In this study, 33 (21.3%) of the nurses held managerial positions. The nurses reported that all (100%) of the department had computers. Of the nurses, 138 (89.0%) used computers in their work and 60 (38.7%) used computers most of the time. In this study, the nurses were interested in the features that facilitate their job and daily duties. The main obstacle limiting higher use of the computerized health information system was a lack of training on how to use the system, Insufficient allocation of resources needed to improve the current system.

Conclusion: A total of 155 nurses participated in this study. 78 (50.3%) were female and 101 (65.2%) were 30 years and younger. In this study, 33 (21.3%) of the nurses held managerial positions. The nurses reported that all (100%) of the department had computers. Of the nurses, 138

(89.0%) used computers in their work and 60 (38.7%) used computers most of the time. In this study, the nurses were interested in the features that facilitate their job and daily duties. The main obstacle limiting higher use of the computerized health information system was a lack of training on how to use the system, Insufficient allocation of resources needed to improve the current system.

Keywords: Patient safety, health informatics, health information system.

Table of Contents

Table of Tables

Table of Appendices

List of Abbreviations

ANOVA	Analysis of variance
HI	Health informatics
HITECH	The Wellbeing Data Innovation for Financial and Clinical Wellbeing Act
LUTH	Lagos University Teaching Hospital
WHO	World Health Organization

CHAPTER ONE

Introduction

1 Introduction

There is a large and rapid development in health informatics with varying degrees of evidence about its impact on patient safety (Alotaibi & Federico, 2017). Although new treatments, technologies, and models of care may have curative potential, there are possible emerging threats to safe care. Today, patient safety was recognized as a challenge to global health as well. Despite pioneering work in some healthcare settings, global efforts to reduce the burden of harm to patients have not changed the extent of the past fifteen years. Safety measures have limited or uneven impact, even those most of which have been adapted to ensure their successful application in lowincome countries and those high-income and middle- income environments (Slawomirski et al., 2017).

The World Health Organization define Patient safety is a "framework of organized activities that creates cultures, processes, procedures, behaviors, technologies and environments in health care that consistently and sustainably lower risks, reduce the occurrence of avoidable harm, make error less likely and reduce its impact when it does occur" (WHO, 2021).

According to last studies, the number of people death because medical error about 251000 deaths annually in the United States, (Anderson & Abrahamson, 2017). Unsafe medicine practices and medicinal medication mistakes are essential reasons of harm and avoidable damage in fitness care structures round the world. Globally, the fee related with medicinal drug blunders has been estimated at forty-two billion greenbacks annually. Errors can take place at distinct tiers of the drug use process. Based on these figures, the World Health Organization has recognized "medicine except harm" as the subject of the 1/3 world mission for affected person protection, (WHO, 2019).

The developments that have occurred are that the electronic health system has been developed and includes health informatics, which is defined as it is one of the broad sciences that is a complex mixture of people, organizations, diseases, comprehensive health care and treatment of those diseases, as well as a scientific field that deals with storage, retrieval, sharing and optimal use of information, data and biomedical knowledge for problem solving and decision making (Aziz et al., 2015).

The global transformation of the digital health landscape is not only technical, but also social and cognitive, so the ultimate goal of this transformation is the health of the individual and society and the reduction of medical errors, and the ultimate goal among these goals is patient safety first and foremost (Sittig et al., 2020).

Health informatics is defined as "the practice of acquiring, studying and managing health data, and applying medical concepts in conjunction with information technology systems to help clinicians provide better healthcare", in final the goal of update this its public good (Dixon et al., 2021).

Sharing health data gives a clearer picture of health, and this data can help prevent many chronic diseases and improve health outcomes. An effective health information system is the foundation of a strong integrated health system and the key to making the necessary health decisions for whom diseases spread based on evidence and health data (Davoody et al., 2019).

The health information systems can also be defined as integrated efforts to collect, report, plan and use health information to make health decisions, conduct programs and scientific research (Gold et al., 2018).

The percentage of the electronic system in the health sector has increased, especially in recent years, as the United States of America depends almost entirely on the electronic system, and its percentage was about ninety-three percent of hospitals adopting the electronic system and adopting the electronic selection system since 2012 the percentage of its use was only 68 percent, but now it has increased to boast As we mentioned earlier, this indicates the success of these systems and their assistance in patient safety, reducing medical errors, and also protecting health sector employees from nurses and doctors (da Silva Serapião Leal et al., 2019).

In light of locale, the worldwide medical care data frameworks market has been classified into North America, Europe, Asia Pacific, Latin America, and Center East and Africa. North America held a conspicuous piece of the pie of the worldwide medical care data frameworks market as far as income in 2017 because of expanding government drives to advance use of medical care data frameworks and presence of countless unmistakable players around here. For example, The Wellbeing Data Innovation for Financial and Clinical Wellbeing (HITECH) Act, instituted as a feature of the American Recuperation and Reinvestment Demonstration of 2009, was acquainted with advance the reception and sane utilization of wellbeing data innovation. In addition, many driving merchants are settled in North America, where they have a higher portion of item deals. Developing business sectors in Asia Pacific hold enormous development potential because of elements like rising pervasiveness of persistent infections, expanding government drives, and expansion in medical care foundation (Quirk et al., 2018; Vickers et al., 2017).

After studying the research on the obstacles that negatively affect the electronic health systems, it was found that there are groups of main obstacles, namely technical problems, operational functions, maintenance and support, usage problems, and quality problems (Tummers et al., 2021).

1.1 Problem Statement

Statistics indicate an increase in medical errors, and this is a serious problem which affect the patient safety (Anderson & Abrahamson, 2017). Data accuracy at 2015 in Palestine was 78.5% for women receiving antenatal care and it reflects a poor system within the hospitals (Mimi, 2015). A new system must be found, but it is important to know the effect of this system on the patient's safety in terms of decreasing medications errors and to update the system.

Patient safety is an essential and vital component of the quality of health care; however, we do not deny that the health care system is prone to errors that can affect patient safety, but these errors occur as a result of flaws in health systems and can be continuously improved.

An integrated health system that takes into account the increasing complexity of the health care environment, which makes the person a healthy environment, without medical errors, and keeping pace with modern information technology. For example, some errors are represented in: The hospitals, patient may not be given the correct medication due to the mixing error caused by similar drug packages. In this case, the prescription goes through different levels of care, from the ward doctor to the pharmacy that dispenses it, to the nurse administering the wrong medication to the patient. If preventative processes exist at different levels of care, this error can be quickly identified and corrected, lack of standard procedures for stockpiling similar drugs, poor communication between different providers, administering the drug before it is checked, and failure to engage patients in their care are probably the main factors that led to errors. The responsibility for such an accident is usually placed on the shoulders of the service provider who made the fault (direct fault), with the possibility of punishment.

The health system in Palestine partially lacks patient safety. In the electronic health system, it lacks procedures to assist in decision-making, and this is a big problem, especially in medicines, which are the most important treatment factors for any patient in Palestine, but in the whole world. Therefore, the system cannot help in making the appropriate decision, and this increases the number of medical errors, especially the pharmaceutical sector.

1.2 Aims of Study

- To assess the effect of health informatics on patient medication safety.
- To compare the effect of the health informatics system between governmental and private hospitals.
- To assess obstacles, & limitations in use of computerized health information systems on medication patient safety.

1.3 Significance of the Study

Safety is an important and crucial issue which touches the care of human being. Therefore, this research will focus on developing specific recommendations to the Palestinian Ministry of Health and private hospitals to develop a medication system to be used by programmers.

This research will contribute to increasing knowledge of healthcare providers about medications and their safe use in patients through provision of evidence-based information in the databases that can be integrated into the electronic databases.

The use of health informatics and computer systems have also changed practice through enabling healthcare providers gain more information and use medications effectively and safely.

Recent research has shown that health informatics and computer systems have reduced the incidence of medication errors and increased patient safety in hospitals.

Computer systems are also powerful in enabling policy and decision makers in health authorities and hospital management gain access to patient as well as therapeutic information including how safely medications were used. This research might also inform policies of medication use in the current practice.

Health informatics and the use of computer systems have facilitated gathering information about trends in prescribing and administering medications. This has enabled researchers collect patient and therapeutic information more easily compared to paper-based systems. Results of this study might inform future studies that would be conducted on patient safety to improve the quality of care used in Palestine and to develop the necessary programs for that noble goal which is "patient safety first."

This study will also test the suitability of the questionnaire that would be used to measure the level of effectiveness of the electronic health system for the drug system in the Palestinian healthcare system. This will contribute to the validity of the questionnaire that might be used in other healthcare systems.

1.4 Research Questions

- Is there an effect of health informatics on patient medication safety?
- Are there differences between private and governmental hospitals using medication system?
- Are there obstacles limit the use of computerized health information medication system?

1.5 Hypotheses

- There are no statistically significant differences at the level of significance ($\alpha \geq 0.05$) in evaluating the impact of health informatics and computer system on patient medication safety due to Demographic data (Age & Gender).
- There is no statistically Significant effect of health informatics on patient medication safety if ($\alpha < 0.05$) in evaluating the effect of Health informatics.
- There is no obstacles, & limitations in use of computerized health information systems on medication patient safety.

CHAPTER TWO

Literature review

2 Literature Review

2.1 Introduction to Literature Review

A literature review using Science Direct databases, Google scholars, and PubMed was performed prior to the start of the study. Keywords used in the searches involved: missed nursing care, nursing omitted nursing care, missed care, nursing information, and nurses. Articles were selected based on their support to the study.

2.2 Studies Found in the Literature

More than 90% of United Kingdom's general practices consistently use computer for clinical consideration (Hammersley et al., 2019; Petersen et al., 2019). Health frameworks contain drug related caveats, and are widely regarded as valuable by most professionals. In general, though, little attention has been paid to other potential safety provisions of its depiction, for example, contraindications warnings. The Information Authority has controlled the use of PC frameworks for general practice by a set of rules known as certification imperatives, however, they only contain extensive security references and there is evidence that they do not preclude use solutions (Tanwar et al., 2020).

In Nigeria, study done to assess the level of knowledge and use of nursing informatics amongst nurses in Lagos University Teaching Hospital (LUTH). The study conducted on 162 participants with Self-administered questionnaire was used to elicit information from the respondents, results of study showed respondents had a good knowledge of nursing informatics and good use of nursing informatics. Therefore, the management should continue to provide avenues

for more training in order to be able to sustain the knowledge and use of informatics among the respondents (Ademuyiwa et al., 2020).

In Jordan and Palestine, a study done to assess the need for health informatics training to determine health informatics (HI) use and to assess the training needs of health professionals. The study conducted in 2017 among employees in all health professions at fourteen hospitals in Jordan and Palestine, the study showed more than half had received training in computer skills but also half said they needed specialized training in health information system (Jabareen et al., 2020).

In Iran, a qualitative study done to explore the most effective factors relating to patient safety, the study was conducted on fourteen participants who were selected by experts who were familiar with the patient safety friendly hospital program by interview. This study showed factors affecting patient safety which divided into two groups: facilitators and barriers. Hospitals can improve implementation of patient safety standards, reduce adverse events and enhance patient safety. Some facilitating factors are, such as providing human resources, appropriate medical equipment and facilities, increase employee participation in quality improvement programs, improve employee training, communicate with patients and their families, and address existing challenges (Naderi et al., 2019).

In Sri Lanka, to assess the factors that affect the patient safety programs in governmental hospitals of Sri Lanka. The study was conducted on 327 participants. In this study, the self-administrated questionnaire was used. The results showed that patient safety programs showed highest correlation with team structure, and lowest with work environment (Sridharan et al., 2017).

In Palestine especially Gaza city, a study done about the impact of hospital information system quality on the health care quality, this study conducted the nurses and doctors in European

hospital, this research study is the good effect of information health system patient safety (Najem, 2016).

In Saudi Arabia, Alotaibi et al reviewed the literature to summarize the evidence on the effect of health information technology on the safety of patients. The review concluded that the use of health information technology increased patient safety, reduced the incidence of medication errors, reduced the incidence of adverse drug effects, and increased adherence to practice guidelines. The study called for larger adoption of health information technologies by health authorities and hospitals (Alotaibi & Federico, 2017).

CHAPTER THREE

Methods

3 Methods

3.1 Introduction to the Methods Section

This chapter provides a detailed description of the research methodology used, in this study including the design, setting, sample and sampling technique, study tools, data collection procedure, ethical considerations, and a description of data analysis plan.

3.2 Research Design

A quantitative. Cross-sectional approach was used to test hypotheses and examine the association between variables.

3.3 Setting of Study

This study targeted the nurses in governmental and private hospitals at North west-bank in Palestine as follow:

- Governmental Hospital: Rafedia Hospital, AL-Watani Hospital, Tubas Hospital, Jenin Hospital, Thabet Thabet Hospital, Darweesh Nazal Hospital.
- Private Hospital: Al-Najah National Hospital, Nablus specialty hospital, Al-Razi Hospital, Ibn Sina Hospital, Al Arabi Hospital.

3.4 Subjects and Sampling Method of the Study

The sample was choosing for data collection was 155 nurses worked at targeted in Palestine Hospital, in this research used a convivence sample, select randomly the nurses worked at different word at targeted hospitals.

Table 3-1: The total number of nurses in all hospitals

#	Name of hospital	Number of nurses
1	Rafedia Hospital	261 Nurse
2	Al-Watni Hospital	109 Nurse
3	Jenin Hospital	224 Nurse
4	Tubas Hospital	68 Nurse
5	Thabet Thabet Hospital	166 Nurse
6	Darweesh Nazal Hospital	92 Nurse
7	Al-Najah Hospital	250 Nurse
8	Nablus Specialty Hospital	95 Nurse
9	Al-Arabi Hospital	110 Nurse
10	Al-Razi Hospital	86 Nurse
11	Ibn Sina Hospital	60 Nurse
	Total	**1521 Nurse**

3.5 Tools of Data Collection

Two tools were used for this study, included validated self-administered questionnaire sheath developed by review the literature and then do pilot study which will be explained later and interviews. The aim of the tools was to collect data quantitatively to answer the research questions. Development of the tool was guided by results that obtained from literature review.

The Questionnaire, consisted of five parts clarified in the following points:

- Part I: This part intended to collect data related to demographical data of the participants such as gender, age…etc.
- Part II: This part intended to collect data related to actual reality of using computerized health information systems in action, it answered all question as required.
- Part III: This part intended to collect data related to the effect of health informatics on patient medication safety, it answered from strongly agree to strongly disagree as question. (Likert scale)
- Part IV: This part intended to collect data related to obstacles that limited the use of computerized health information system on patient medications safety, it answered from strongly agree to strongly disagree as question. (Likert scale)
- Part V: This part intended to collect data related to the presence of support system in the use of patient medication safety, it answered all question as required.

The second tool was through conducting interviews with the nursing manger in the hospitals, the following questions were used in interviews:

- What is your perception about the ease of the electronic medical records system currently in use?
- What are your inputs as a nursing director on this system?
- What are your previous experiences in electronic medical records?
- What is the benefit of the electronic medical records system for your business?
- How do you think the electronic medical records related to the drugs for patients?
- What are the obstacles facing the patient's electronic medication system?

- In your opinion, what features can be added to improve the system in force now to make it better?
- How could the electronic patient medication system be better than the paper-based system, and why?

3.6 Data Collection Procedure

The data collection process was carried out from 1/3/2021 to 1/7/2021 by distributing an electronic questionnaire designed by the researcher and then was distributed to participants. Some paper questionnaires were also distributed and filled out by the participants, and after they were filled out by the participants, they were entered into programs for analysis so that questionnaires were almost deleted due to the lack of complete answers to the questionnaire. The interview was carried out from 1/7/2021 to 1/10/2021 by question to nurse's manager.

- Inclusion criteria: all selected nurses based on the selection criteria, Age and gender because their effect on patient safety.
- Exclusion criteria: nurses who are out of the selection criteria, all demographic data except age and gender

3.7 Ethical Considerations

This study was approved by the faculty of higher studies at Arab American University – research ethical committee. In addition, ethical approval was obtained from the Ministry of Health and each private hospital as well as the participant. The researcher also guaranteed the participants right to privacy and anonymity, and data's confidentiality by preventing unauthorized access. The researcher prepared a consent form which was signed by participant to conduct the study before

starting the data collection process. The study information was sent to the participants as it included the reasons and importance of the study attached to the questionnaire with an explanation that participation in the study is optional, the study is for research purposes only and that all information will remain strictly confidential and the participant's names are not mentioned.

3.8 Pilot Study

An experimental sample was made in the Turkish Tubas Hospital, where nurses participated in the pilot study. After this experiment, this data enters to data analysis, as the exploratory result of Cronbach's Alpha was (0.824), the results were deleted from the final results.

3.9 Validity and Reliability

The questionnaire was made by reviewing previous research, then it was sent to four specialists in this specialization and it was approved by the four specialists. The questionnaire was tested on a sample of participants from the Turkish Tubas Hospital and doing face validity and content validity, it's got high score.

3.10 Statistical Analysis

All data were analyzed using the Statistical Package for Social Sciences (SPSS version 23.0, SPSS Inc., Chicago, IL, 2016). Descriptive statistics were used to analyze the collected data. Analysis of variance (ANOVA) (confidence interval 95%) was used to answer all question. The results of the interviews were summarized narratively after recording the whole interviews with a permission from the nursing directors.

CHAPTER FOUR

Results

4 Results

4.1 Introduction to the Results Section

The study aimed to assess the effect of health informatics on patient safety. This chapter presents the main findings of the study using descriptive and inferential analysis. The study targeted Nurses in north west Bank hospitals in Palestine; 155 nurses participated in the study after removing the incomplete questionnaires. The results of the study were presented as following:

4.2 Questionnaire Analysis

Table 4-1: The demographic data

Parameters		**No.**	**Percent**
Gender	Male	77	49.7
	Female	78	50.3
Age	20 y-30 y	101	65.2
	31 y-40 y	30	19.4
	41 y-50 y	24	15.5
Total		**155**	**100**

This table showed that around 49.7% the sample was male, and 50.3% female, the highest percentage of sample 65.2% was age is 20 years to 30 years, while the lowest percentage 15.5% was aged 41 years to 50 years.

Table 4-2: The experience

Parameters	**No.**	**Percent**
Less than 1 Years	34	21.9
1-5 Years	60	38.7
6-10 years	42	27.1
more than 10 Years	19	12.3
Total	**155**	**100**

This table showed the experience of participant is 38.7% from 1years to 5 years, 21.9% for participant less than 1 year, 27.1% for participant has experiences from 6 years to 10 years, and 12.3% for participant has experiences more 10 years.

Table 4-3: Education level

Parameters	**No.**	**Percent**
Diploma	60	38.7
Bachelors	80	51.6
Master	13	8.4
PhD	2	1.3
Total	**155**	**155**

This table showed the education level of participant, 51.6% has bachelor degree, 38.7% has diploma, 8.4% has master, and 1.3% has PhD degree.

Table 4-4: Social status

Parameters	**No.**	**Percent**
Engaged	19	12.3
Married	59	38.1
Single	77	49.7
Total	**155**	**100**

This table showed social status of participant, 49.7% of participants are single, 38.1% of participants are married, and 12.3% of participants are engaged.

Table 4-5: Area of residence

Parameters	**No.**	**Percent**
City	57	36.8
Village	66	42.6
Camp	32	20.6
Total	**155**	**100**

This table showed area of residence for participants, 42.6% of participants live in villages, 36.8% of participants live in cities, and 20.6% of participants live in camps.

4-6: Managerial position

Parameters	**No.**	**Percent**
Yes	33	21.3
No	122	78.7
Total	**155**	**100**

This table showed 78.7 % of participant didn't has managerial position, and 21.3 % of participant has managerial position.

Table 4-7: Medical departments

Parameters	**No.**	**Percent**
Intensive care Unit	50	32.3
Open ward	64	41.3
Emergency ward	4	2.6
Dialysis ward	13	8.4
Medical Ward	12	7.7
Surgical Ward	2	1.3
Obstetrics and Gynecology Ward	10	6.5
Total	**155**	**100**

This table showed the medical departments of participants, 41.3 % of participants working in open wards, 32.3% of participants working in Intensive care units, 8.4 of participants working in

dialysis words, 7.7 % of participants working in medical words, 6.5 % of participants working in obstetrics and gynecology Wards, 2.6 % of participants working in emergency departments, and 1.3 % of participant working in Surgical wards.

Table 4-8: Hospitals

Parameters	**No.**	**Percent**
Jenin Hospital	28	18.6
Tulkarem Hospital	21	14
Al-Najah Hospital	20	12.9
Al-Watni Hospital	29	18.7
Darwish Nazal	13	8.4
Ibn Sina Hospital	8	5.2
Nablus Hospital	7	4.5
Al-Razi Hospital	12	7.7
Rafedia Hospital	9	5.8
Al Arabi Hospital	8	4.2
Total	**155**	**100**

This table showed hospital participant, 18.6 % of participant work in Jenin hospital, 14 % of participant work in Tulkarem hospital, 12.9% of participant work in Al-Najah hospital, 18.7 % of participant work in Al-Watni hospital, 8.4 % of participant work in Qalqilya hospital, 5.2 % of participant work in ibn Cena hospital, 4.5 % of participant work in Nablus hospital,7.7 % of participant work in Al-Razi hospital, 5.8 % of participant work in Rafedia hospital, and 4.2 % of participant work at Al-Arabi hospital.

4-9: Is there a computer in your department?

Parameters	**No.**	**Percent**
Yes	155	100
No	0	0
Total	**155**	**100**

This table showed if in department computer, 100% has computer in department.

Table 4-10: How many computers are in your department?

Parameters	**No.**	**Percent**
One	21	13.5
Two	105	67.7
Three or more	29	18.7
Total	**155**	**100**

This table showed number of computers in each department, 67.7 % of departments have two computers, 18.7% of departments have three or more computer, and 13.5 % of departments have one computer.

4-11: Are you using computerized health information systems in your work?

Parameters	**No.**	**Percent**
Yes	138	89
No	17	11

Total	**155**	**100**

This table showed using health information system in hospitals, 89 % of participants uses the health information system, 11% didn't use the health information system.

Table 4-12: How often do you use computerized health information systems in your work?

Parameters	**No.**	**percent**
Most of time	60	38.7
Frequently	73	47.1
Some Times	5	3.2
A little Bit	17	11
Total	**155**	**100**

This table showed participants use of health information system ,47.1 % of participant use frequently of health information system in work,38.7 % of participant use most of time of health information system in work, 11% of participant use a little bit of health information system in work, and 3.2 % of participant use sometimes of health information system in work.

Table 4-13: Measuring the effect of health informatics on patient medication safety

No.	**Question**	**Mean**	**Standard Deviation**
1	It provides sufficient information on the drugs in terms comprehensiveness of the case Pathogenesis.	2.90	1.10

2	It provides accurate information to make the necessary treatment decisions for a disease	2.77	1.15
3	It facilitates the process of linking drug information with each other and analyzing it in order to make the right decision.	2.79	1.26
4	It facilitates the electronic communication and coordination between hospital wards and the IT medical records department	2.71	1.22
5	It facilitates the process of filling out forms and completing the necessary information from nurses.	2.75	1.31
6	It facilitates access to medical records and medications taken by the patient	2.85	1.25
7	It contributes to activating the medical control process on the implementation mechanism of decisions taken.	2.97	1.28
8	The system gives an alarm when there is evidence that either drug discontinued or expire	3.30	1.42
9	The system gives an alarm if two drugs from the same family prescribed from two Dr. Specialist for the same patient	3.59	1.40

No.	**Question**	**Mean**	**Standard Deviation**

10	The system gives an alarm if there is duplication in any prescribed medication by same Doctor.	3.42	1.50
11	The system gives a curative monitoring indication of therapeutic and non-toxic level.	3.57	1.42
12	Were there repeated alerts indicating a chronic pattern	3.59	1.37
13	The system gives an alert when the medication is delayed.	3.61	1.38
14	The system gives an alarm when two drugs from the same family are written.	3.59	1.35
15	The system give alert if there is contraindications for medication.	3.59	1.46
16	The system give alert for allergy for this medication after enter the history of pt.	3.56	1.49
17	The system-recalling nurses who need blood test monitoring after give the more dose of medication.	3.60	1.45
18	The system give alert when dr. prescribe medication on same group.	3.75	1.35
19	The system give alert when nurse's signature is unscheduled.	3.63	1.41
	Measuring the effect of health informatics on patient medication safety	**3.29**	**0.85**

This table showed the effect of health informatics on patient safety, the highest mean is 3.7 of statement said (The system give alert when the doctor prescribe medication on same group), the low mean is 2.70 of statement said (It facilitates the electronic communication and coordination between hospital wards and the IT medical records department), and total mean is 3.29.

Table 4-14: Obstacles that limit the use of computerized health information system on patient medications safety

No.	Question	Mean	Standard Deviation
1	Inadequate training for employees on how to use the health information system.	2.62	0.95
2	Weak financial allocations required to provide and update these systems	2.62	0.94
3	Top management is not convinced of the necessity to use medicine-specific health information systems	2.32	0.73
4	Frequent malfunctions in devices and networks, and insufficient maintenance	2.59	0.89
5	Lack of effective control over the health information system	2.45	0.81
	Obstacles that limit the use of computerized health information system on patient medications safety.	**2.52**	**0.66**

This table showed the Obstacles that limit the use of computerized health information system on patient medications safety, the highest mean is 2.62 of statement said (Inadequate training for employees on how to use the health information system.), the low mean is 2.32 of

statement said (Top management is not convinced of the necessity to use medicine-specific health information systems) and total mean is 2.52.

Table 4-15: Organization have a policy if there are problems with the computer system either you or other using

Parameters	**No.**	**Percent**
Hardware		
Yes	98	63.2
NO	43	27.7
Don' t know	14	9
Total	**155**	**100**
Parameters	**No.**	**Percent**
Software		
Yes	116	74.8
No	25	16.1
Don't know	14	9
Total	**155**	**100**

This table showed policy in organization if there are problem, for hardware, 63.2 of participant answer yes, 27.7 % of participant answered no, and 9 % of participant answered don't know, for software, 74.8 % of participant answers yes, 16.1 % of participant answered no, and 9 % of participant answered don't know.

Table 4-16: Offers the medication system support

Parameters	No.	Percent
Hardware		
In-house	130	83.9
Contractor	3	1.9
Health services	22	14.2
Total	**155**	**100**
Software		
In-house	125	80.6
Contractor	16	10.3
Health services	14	9
Parameters	**No.**	**Percent**
Total	**155**	**100**

This table showed the offer of the medication system support, for hardware, 83.9% of participant answer in-house, 1.9 % of participant answered contractor, and 14.2% of participant answered health services, for software ,80.6 % of participant answer in-house, 10.3 % of participant answered contractor, and 9 % of participant answered health services.

Table 4-17: Level of technical support is provided on weekends

Parameters	**No.**	**Percent**
Hardware		
Limited day to hours (E.g.5-9 hours)	44	28.4
12 hours a day	49	31.6
24 hours a day	52	33.5
Don’t know	10	6.5
Total	**155**	**100**
Software		
Limited day to hours (E.g.5-9 hours)	99	63.9
12 hours a day	28	18.1
24 hours a day	18	11.6
Don’t know	10	6.5
Parameters	**No.**	**Percent**
Total	**155**	**100**

This table showed level of technical support provided on weekends, for hardware, 28.4 % of participant answer limited m 31.6 % of participant answered 12 hours a day, 33.5 % of participant answered 24 hours a day, and 6.5 of participant answered don’t know, for software, 63.9 % of

participant answer limited, 18.1 % of participant answered 12 hours a day, 11.6 % of participant answered 24 hours a day, and 6.5 of participant answered don't know.

Table 4-18: Level of technical support is provided on Sunday to Thursday

Parameters	**No.**	**Percent**
Hardware		
Limited day to hours (E.g.5-9 hours)	66	42.6
12 hours a day	52	33.5
24 hours a day	29	18.7
Don't know	8	5.2
Total	**155**	**100**
Software		
Limited day to hours (E.g.5-9 hours)	120	77.4
12 hours a day	8	5.2
24 hours a day	18	11.6
Parameters	**No.**	**Percent**
Don't know	9	5.8
Total	**155**	**100**

This table showed level of technical support provided from Sunday to Thursday, for hardware, 42.6 % of participant answer limited, 33.5 % of participant answered 12 hours a day,

18.7 % of participant answered 24 hours a day, and 5.2 of participant answered don't know, for software, 5.2% of participant answer limited, 11.6 % of participant answered 12 hours a day, 11.6 % of participant answered 24 hours a day, and 5.8% of participant answered don't know.

Table 4-19: Support in my workplace believes

Parameters	**No.**	**Percent**
Hard ware		
Excellent	20	12.9
Good	43	27.7
Fair	55	35.5
Poor	31	20
Awful	3	1.9
Don't know	3	1.9
Total	155	100
Soft ware		
Excellent	35	22.6
Good	61	39.4
Parameters	**No.**	**Percent**
Fair	28	18.1
Poor	27	17.4
Awful	4	2.6
Don't know	35	22.6
Total	155	100

This table showed evaluation of support for health information system, for hardware , 12.9 % of participant evaluate is excellent, 27.7 % of participant evaluate good, 35.5% of participant evaluate fair, 20 % of participant evaluate poor,1.9 % of participant evaluate awful, 1.9 % of participant evaluate don't know, for software, 22.6 % of participant evaluate is excellent, 39.4 % of participant evaluate good, 18.1% of participant evaluate fair, 17.4 % of participant evaluate poor,2.6 % of participant evaluate awful, 22.6 % of participant evaluate don't know.

Table 4-20: The relation between the gender and effect health information system and obstacles on patient medication safety

Parameter	**N**	**Mean**	**Std.Deviation**	**Significance**
Gender and the effect of HIS				
Male	77	3.32	0.80	0.108
Female	78	3.26	0.89	
Gender and obstacles				
Male	77	2.55	0.67	0.341
Female	78	2.49	0.66	

This table showed the relation between the gender and the effect of health information system and obstacles on patient medication safety, there no has relationship between gender and the effect of health information system, because the sig about 0.108, and no have the relationship between the obstacles and gender because sig about 0.341.

Table 4-21: The relation between the age and effect his and obstacles on patient medication safety

Parameter	N	Mean	St. Deviation	Significance
Age and the effect of HIS				
20 -30 y	101	3.27		
31-40	30	3.61	4.13	0.018
41-50	24	2.96		
Age and obstacles				
20-30	101	2.56		
31-40	30	2.53	1.27	0.284
41-50	24	2.33		

This table showed the relation between the age and the effect of health information system and obstacles on patient medication safety, there was a relation between age and the effect if health information system because the significance about 0.018, and no have the relationship between the obstacles and age because significance about 0.284.

4.3 Interviews Results

Interviews were conducted of nursing manager in different hospitals, the interviews were recorded and the answers were summarized as follow:

- What is your perception about the ease of the electronic medical records system currently in use?

"In the beginning, there was a difficulty in using the electronic patient records system, as everyone found it difficult to use it without training, but with time and taking the necessary courses and education how to use it became easier, it can be said that it was difficult beginning, but with the passage of time it becomes easier."

- What are your inputs as a nursing manager on this system?

"The inputs as nursing manager are represented only by the number of beds and it can be increased by as extra bed in each department, but it is not possible to add this bed without the approval of the nursing manager, and it is also represented in the monthly nursing schedules, and finally represented by the number of patients and nurses who work during the shift. But as a nursing manager, I can see the nursing notes and the patient's status through the system, but I can`t interfere with these parameters, only I can monitor them."

- What are your previous experiences in electronic medical records?

"It was found that there is no experience with nursing manager in electronic system because they are not taught at the university, but the directors' recommendations were that this subject be taught and included in the nursing study plan in the West Bank, so that nursing could easily use these records."

- What is the benefit of the electronic medical records system for your business?

"Which is that the patients' electronic medical records are useful, that it is easy to work with the patient, and also is the ease of communication with the nursing, unlike the paper system, which has become outdated and does not meet the needs of patients or workers in the health sector. As health workers prefer anything to facilitate their work and save time from it. In the past, they used to suffer from many problems, but today they have become less problems."

- How do you think the electronic medical records related to the drugs for patients?

“These records represented a cornerstone of the records, as they contained the patients’ medications that they took in the hospital, but not the medications that the patient takes at home, and any medication given to the patient is recorded in his electronic medical record with the scientific name of the drug".

- What are the obstacles facing the patient's electronic medication system?

"According to nursing manager, are that the existing drugs have more than one dose for one medication, and the scientific name is not the recognized trade name, as doctors write the accepted trade name, not the recognized name, when writing the application for drugs. Teaching is based on the scientific name only in universities and this is a very big problem for new nursing.in addition, problem it is that there is no drug-matching system and there is no testing system. Is there an interaction between drugs first, and there is no system that the drug dose is correct”.

- In your opinion, what features can be added to improve the system in force now to make it better?

“The used medication system can be improved by adding systems for calculating the required dose for the patient according to his weight, age, health status, and the necessary examinations. Also, a system can be added to show whether there is an interaction between medicines. It is not necessary to check this interaction on Medscape, as this application shows the interaction between medicines, so this system must be added to the electronic system.”

- How could the electronic patient medication system be better than the paper-based system, and why?

“The electronic patient treatment makes it easier for patients to enter their records and see the medicines and why they were given, according to which situation this medicine was chosen, as some patients prefer cheap medicine and not expensive, and these medicines are not suitable for their health status.”

CHAPTER FIVE

Discussion

5 Discussion

In almost all healthcare systems around the world, patient safety has been placed as a top priority (Anderson & Abrahamson, 2017). Despite prioritization of patient safety, recent studies have shown that medical errors remain highly prevalent jeopardizing the safety and integrity of the patients (Donaldson et al., 2017). With the advent of health informatics, computers are increasingly used in facilitating archiving of patient information and supporting clinical decisions in today's healthcare systems (Jabareen et al., 2020). This study was conducted to investigate the effects of computerized health information systems on patient safety from the viewpoint of nurses in different Palestinian hospitals. The study also explored the perceived obstacles of using the computerized health information system from the viewpoint of nurses.

The findings of this study showed that at least one computer was available in all departments where the nurses who participated in this study practiced. Of the nurses surveyed in this study, 86.4% indicated that two or more computers were available in the departments where they practiced. The findings of this study were consistent with those previously reported elsewhere on the increasing use of computers in healthcare (Chau et al., 2019; Kuek & Hakkennes, 2020). Previous studies have shown that the percentage of hospitals using computers differed by year in which the study was conducted, country, and type of hospital (Muinga et al., 2020; Xing et al., 2018). In the 1970s, less than 40% of non-federal hospitals in the US were using computers, (Shrestha, 2020). Over time, this percentage increased to almost all hospitals in the US and elsewhere using some computerized system. In a recent study conducted in Kenya, Muinga et al (2020) interviewed health records information officers, managers of public hospitals, and digital health system vendors (Muinga et al., 2020). The study reported that all facilities acquired some

sort of digital health system. Although the primary aim of obtaining these digital health systems was for administrative/managerial purposes, the study also showed that the radiology department and laboratory often used a standalone system (Muinga et al., 2020). The findings of this study might indicate that computers were widely available in the Palestinian healthcare system. This could provide more room and opportunities for continuous development and implementation of electronic healthcare record systems (Jabareen et al., 2020).

In this study, the vast majority of the nurses (89.0%) reported frequent use of computerized health information systems in their work. When inquired on the frequency of use, the vast majority (89.0%) reported that they used the computerized health information system sometimes, frequently, or most of the time. In this study, variability in the frequency of use of the computerized health information system could be explained by differences in needs between the departments in which the nurses were currently practicing and computer literacy among the nurses. The findings of this study were not surprising because nurses provide the largest volume of healthcare services in almost all healthcare systems around the world (Leonardsen et al., 2020; Shin & Park, 2018; Yi et al., 2020). Therefore, nurses often need to log into the computerized health information system to review important health information, receive orders, and document healthcare services (Zhou et al., 2019).

When the nurses inquired about the benefits of the computerized health information system, items like facilitating electronic communication and coordinating between wards and IT medical records department (item #4), facilitating filling out forms (item #5), providing accurate information to facilitate selection of treatment (item #2), facilitating linking drug information and supporting clinical decision making (item #3), facilitating access to medical records (item #6), providing detailed information of the drugs that can be used (item #1), and facilitating medical

control process in decision making (item #7) received low scores. On the other hand, items like measuring medication safety of the patient (item #20), giving an alarm if a drug expired or discontinued (item #8), giving an alarm if a medication order was duplicated (item #10), giving an alarm when the patient has an allergy for a drug (item #16), facilitating monitoring drug action and toxicity (item #11), giving an alarm if a drug was used chronically (item #12), giving an alarm if a drug was contraindicated (item #15), giving an alarm if two drugs from the same family were prescribed (item #14), giving an alarm when two drugs from the same family were prescribed by more than one physician (item #9), and notifying nurses when a blood test/drug was needed (item #17) received higher scores. Items like giving an alarm if a drug was delayed (item #13), giving an alarm if a signature was missing (item #19), and giving an alarm if another drug was prescribed from the same group (item #18) received the highest scores. These findings could indicate that nurses were more interested in the features that facilitate their job and daily duties (Zadvinskis et al., 2018). In this study, the nurses were more interested in the features when the computerized health information system made alters to notify them when a drug or when a blood draw was needed.

In this study, the main obstacle limiting higher use of the computerized health information system in improving patient safety was a lack of training on how to use the system. The findings of this study were consistent with those reported in a recent study that was conducted among nurses in 14 Palestinian hospitals (Batran et al., 2022). Batran et al (2022) reported that Palestinian nurses had low informatics competency, informatics skills, and clinical decision-making (Batran et al., 2022). The study concluded that nurses in Palestinian hospitals needed adequate training to improve their informatics competency, informatics skills, and clinical decision-making. Insufficient allocation of resources needed to improve the current system was another important obstacle

reported by the nurses in this study. The findings of this study were consistent with those reported in low-income countries like Kenya and Ghana (Batran et al., 2022; Muinga et al., 2020; Zhou et al., 2019). Frequent device and network malfunctions and lack of effective control were also cited as major obstacles limiting the use of computerized health information systems in this study. These findings were consistent with those reported with a previous study that reported on the merits and desiderata that need to be considered when designing and implementing a computerized health information system (Shawahna, 2019). The last obstacle cited by the nurses was the lack of convincing the top management of the use of computerized health information systems. The findings of this study might be considered a call to convince the top management to invest more in computerized health information systems, (Adatara et al., 2019).

In this study, more than half of the nurses stated that there were policies in place to support them in case of a problem with hardware (63.2%) or software (74.8%). Of the nurses, 83.9% and 80.6% stated that support was provided by in-house officers. The nurses stated that 24-hours support with hardware and software was not available in the majority of the cases. Of the nurses, less than half of the nurses rated support with hardware and software as excellent or good. These findings indicate dissatisfaction with the quality of hardware and software support provided. The findings of this study were consistent with those reported in previous studies (Adaba & Kebebew, 2018). Developers of computer health information systems and IT companies need to consider difficulties that might be faced by nurses who use the systems (Adaba & Kebebew, 2018). The findings of this study highlight the need for more support and coverage for hardware and software problems. The top management needs to consider these difficulties and allocate more resources to technical support.

In this study, gender was not significantly associated with either impact of the computerized health information system on patient safety or obstacles. On the other hand, age was significantly associated with age. Younger nurses tended to significantly rate the effects of the computerized health information system on patient safety. It is well-established that younger healthcare providers are more likely to be users of computers and the internet than older healthcare providers (Hunsaker & Hargittai, 2018; Nimrod, 2018). The qualitative part of this study provided more insights from the perspectives of nurses in managerial/higher hierarchy positions. In general, the nursing directors were positive about the ease of using computerized health information systems with the passage of time and more training. As with every new system, nurses need adequate training to work efficiently with the installed computerized health information systems (Adaba & Kebebew, 2018; Adatara et al., 2019). In this study, the matrons who were interviewed stated that there was a need to teach/train future nurses on how to use computerized health information systems. Previous studies have shown that the proficiency of nurses with using the computerized health information systems improved with training (Banihani & Al Qadire, 2021; Xing et al., 2020).

5.1 Strengths and Limitations of the Study

This study has some strengths and limitations that need to be considered when interpreting the findings. First, this is the first study on the impact of computerized health information systems on the safety of patients in Palestine. Additionally, the findings of this study identified the obstacles limiting the use of computerized health information systems by nurses. Second, a stratified random sampling procedure was used in this study. Randomized sampling techniques are superior and less prone to selection bias compared to non-randomized techniques like convenience sampling. Third, the nurses in this study were recruited from different hospitals across the West Bank. This should

have ensured the representation of nurses from different regions. Fourth, the nurses were recruited from different departments. This should have ensured representation of all types of nurses working within the hospitals in Palestine. Fifth, this study was conducted in two phases: a quantitative phase using a questionnaire and a qualitative phase using interviews. Combining quantitative and qualitative methods should have enriched the findings reported in this study. Finally, the questionnaire that was used in this study was previously validated. Using validated study tools should have ensured the generation of relevant and valid findings.

On the other hand, this study has some limitations. First, although the nurses were recruited from different hospitals across the West Bank, the sample size was relatively small. The inclusion of larger sample size should have produced more reliable data. Second, the results reported in this study are merely viewpoints/opinions of the nurses who participated in the study. In this study, we did not use other methods to measure support provided for the nurses about hardware and software. Third, we cannot exclude desirability bias in this study. As nurses had to report on their preferences and opinions about a system they use at their places of work, this could have biased the opinions of the nurses who might have tended to provide more positive answers.

5.2 Conclusion

Based on the findings of this study, the conclusion is:

- They major effect of health informatics and computer system on patient safety.
- Several obstacles limit the nurses from using computerized health information systems.
- They needed more support with hardware and software that should be provided more frequently when needed

5.3 Recommendations

Based on study findings, the following recommendations can be suggestion:

- Decision-makers in managerial positions need to allocate more resources and invest in improving current computerized health information systems in Palestinian hospitals.
- Decision-makers in managerial positions need to provide more support for hardware and software problems that nurses face during their daily routine.
- Nurses working in different hospitals in Palestine need more training on how to use the computerized health information systems to facilitate their daily duties and improve the safety of the patients.

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Appendices

Appendix 1: The questionnaire

The effect of health informatics and computer system on Patient Medication safety at Palestinian Hospitals.

Informed Consent

Dear Participant:
I am a master student at the faculty of high studies at Arab American University-Ramallah, kindly invites you to participate in this research study. The study is carried out as part of fulfilling the requirements for master degree in Health informatics. This study aims to assess Impact of Health Informatics and computer system on Patient safety. Your participation is voluntary, your cooperation is highly appreciated . You have the right to withdraw at any time during data collection process without limitation. Filling the questionnaire will not take more than 15 minutes from your time, and assuring that your answers will be kept anonymous and confidential and will be used for the research purposes only.
Thanks.
If you have any further inquiry about the questionnaire, please call Mr. Fuad Maraw'a at (0568966612)

Students: Fuad Maraw'a Supervised By: Dr.Imad Abu Khader and Dr.Nisreen Salama

Part I: Demographic Data

Please put a tick mark (√) next to your choice on the following items:

Gender: □ Male □ Female
Age: □ 20-30 □ 41-50 □ 31-40 □ 51 and above
Experience: □ Less than 1 Year □ 1-5 Years □ 6-10 years □ more than 10 Years
Education Level: □ Diploma □ Master □ Bachelors
Social Status: □ Engaged Single □ Married □ Widow □ Divorced
Area of residence: □ City □ Village □ Camp Do you have
managerial position?

Your Department ……
Your hospital ……

Part II: The actual reality of using computerized health information systems in action

Please put a tick mark (√) next to your choice on the following items:

Is there a computer in your department? □ Yes □ No
How many computers are in your department? □ None □ One □ Two □ Three or more
Are you using computerized health information systems in your work? □ Yes □ No
How often do you use computerized health information systems in your Work? □ Most of time □ Frequently □ Some Times □ A little Bit

Part III: Measuring the effect of health informatics on patient medication safety

Please put a tick mark (√) taking into consideration that 1 means Strongly agree, 2 means agree, 3 means don`t know, 4 means Disagree, 5 Means strongly Disagree

		Evaluation				
#	**Measure Statement**	**Strongly Agree 1**	**Agree 2**	**I Don`t Know 3**	**Disagree 4**	**Strongly Disagree 5**
1	It provides sufficient information on the drugs in terms comprehensiveness of the case Pathogenesis.					
2	It provides accurate information to make the necessary treatment decisions for a disease					
3	It facilitates the process of linking drug information with each other and analyzing it in order to make the right decision.					

4	It facilitates the electronic communication and coordination between hospital wards and the IT medical records department					
5	It facilitates the process of filling out forms and completing the necessary information from nurses.					

		Evaluation				
#	**Measure Statement**	**Strongly Agree 1**	**Agree 2**	**I Don`t Know 3**	**Disagree 4**	**Strongly Disagree 5**
6	It facilitates access to medical records and medications taken by the patient					
7	It contributes to activating the medical control process on the implementation mechanism of decisions taken.					
8	The system gives an alarm when there is an evidence that either drug discontinued or expire					
9	The system gives an alarm if two drugs from the same family prescribed from two Dr. Specialist for the same patient					
10	The system gives an alarm if there is duplication in any prescribed medication by same Doctor.					

11	The system gives a curative monitoring indication of therapeutic and non-toxic level.					
12	Were there repeated alerts indicating a chronic pattern					
13	The system gives an alert when the medication is delayed.					
14	The system gives an alarm when two drugs from the same family are written.					
15	The system give alert if there is					
		Evaluation				
#	**Measure Statement**	**Strongly Agree 1**	**Agree 2**	**I Don`t Know 3**	**Disagree 4**	**Strongly Disagree 5**
	contraindications for medication.					
16	The system give alert for allergy for this medication after enter the history of pt.					
17	The system-recalling nurses who need blood test monitoring after give the more dose of medication.					
18	The system give alert when dr. prescribe medication on same group.					
19	The system give alert when nurse's signature is unscheduled.					

Part IV: Obstacles that limit the use of computerized health information system on patient medications safety

Please put a tick mark (√) taking into consideration for items that 1 means Strongly agree, 2 means agree, 3 means don`t know, 4 means Disagree, 5 Means strongly Disagree

		Evaluation				
#	Barrier	Strongly Agree 1	Agree 2	I Don`t Know 3	Disagree 4	Strongly Disagree 5
1	Inadequate training for employees on how to use the health information system.					
2	Weak financial allocations required to provide and update these systems					
3	Top management is not convinced of the necessity to use medicine-specific health information systems					
4	Frequent malfunctions in devices and networks, and insufficient maintenance					
5	Lack of effective control over the health information system					

Part V: The presence of support system in the use of patient medication safety.

Please put a tick mark (√) next to your choice on the following items:

Does your organization have a policy if there are problems with the computer system either you or other using?
Hardware: □Yes □ No □Don't Know
Software: □Yes □ No □Don't Know Who
offers the medication system support?
Hardware: □ In-house □ Health services
Software: □ In-house □ Health services
What level of technical support is provided on weekends?
Hardware: □ None □ Limited day to hours (E.g.5-9 hours) □ 12 hours a day 24 hours a day □ do not know
Software: □ None □ Limited day to hours (E.g.5-9 hours) □ 12 hours a day 24 hours a day □ do not know
What level of technical support is provided on Sunday to Thursday?
Hardware: □ None □ Limited day to hours (E.g.5-9 hours) □ 12 hours a day 24 hours a day □ do not know
Software: □ None □ Limited day to hours (E.g.5-9 hours) □ 12 hours a day 24 hours a day □ do not know
I believe that it support in my workplace is…
Hardware: □ Excellent □ Good □ Fair □ Poor □ Awful □ Don't know
Software: □ Excellent □ Good □ Fair □ Poor □ Awful □ Don't know

Appendix 2: The interview questions

- What is your perception about the ease of the electronic medical records system currently in use?
- What are your inputs as a nursing director on this system?
- What are your previous experiences in electronic medical records?
- What is the benefit of the electronic medical records system for your business?
- How do you think the electronic medical records related to the drugs for patients?
- What are the obstacles facing the patient's electronic medication system?
- In your opinion, what features can be added to improve the system in force now to make it better?
- How could the electronic patient medication system be better than the paperbased system, and why?

Appendix 3: The study approval

15/01/2013 01:51 RECEIVED 03/06/2015 04:30 092333901 97042510813 MOH AAUJ PAGE 01/01

State of Palestine	دولة فلسطين
Ministry of Health - Nablus	وزارة الصحة- نابلس
General Directorate of Education in Health	**الإدارة العامة للتعليم الصحي**

Ref.: ....
Date:..................

الرقم: عجا/٩٠/٢٠٢١
التاريخ: ٩/٣/٢٠٢١

الأخ مدير عام الإدارة العامة للمستشفيات المحترم،،،

تحية واحترام...

الموضوع: تسهيل مهمة

يرجى التكرم بتسهيل مهمة الطالب: فؤاد سعيد مرعي/ ماجستير معلوماتية صحية- الجامعة العربية الأمريكية، لعمل بحث بعنوان:

"تأثير المعلوماتية الصحية على سلامة المريض في المستشفيات الفلسطينية"

وذلك بالسماح للطالب بالحصول على المعلومات من خلال تعبئة استبانة من قبل الممرضين، وذلك في مستشفيات المحافظات التالية:

- جنين - طوباس - نابلس - قلقيلية - طولكرم

على أن يتم الالتزام بجميع تعليمات وإجراءات الوقاية الصادرة عن وزارة الصحة بخصوص جائحة كورونا، وتحت طائلة المسؤولية.

على ان يتم تزويدنا بنسخة من نتائج البحث والتعهد بعدم النشر.

مع الاحترام...

د. عبد الله القواسمي

مدير التعليم الصحي والبحث العلمي

نسخة : معالي وزيرة الصحة حفظها الله

: مشرف الدراسة المحترم/ الجامعة العربية الامريكية

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ص.ب. 14
تلفون: 09-2333901

تأثير المعلوماتية الصحية على سلامة المريض في المستشفيات الفلسطينية

فؤاد سعيد مرعي

الملخص

خلفية الدارسة: هناك تطور كبير وسريع في المعلوماتية الصحية بدرجات متفاوتة من الأدلة حول تأثيرها على سلامة المرضى. يفتقر النظام الصحي في فلسطين جزئياً إلى سلامة المرضى.

هدف الدارسة: أجريت هذه الدراسة لتبيان تأثير أنظمة المعلومات الصحية المحوسبة على سلامة المرضى وتبيان العوائق المتصورة لاستخدام نظام المعلومات الصحية المحوسب من وجهة نظر الممرضات/الممرضين.

الطريقة: تم استخدام النهج الوصفي والكمي المقطعي لاختبار الفرضيات وفحص الارتباط بين المتغيارت. تم إجراء الجزء المقطعي من هذه الدارسة باستخدام استبيان ذاتي ، واستخدم جزء من المقابلات المتضمنة لمدير التمريض في المستشفيات. تم تجنيد المشاركين في الدارسة من مستشفيات مختلفة في شمال الضفة الغربية من فلسطين.

النتائج: شارك ما مجموعه 155 ممرض/ممرضة في هذه الدارسة. شارك ما مجموعه 78 (50.3%) من الإناث و 101 (65.2%) كانوا 30 سنة أو أقل. في هذه الدراسة، شغل 33 (21.3%) من المشاركين مناصب إدارية. من بين الممرضات ، 138 (89.0٪) استخدموا أجهزة الكمبيوتر في عملهم و 60 (38.7٪) يستخدمون أجهزة الكمبيوتر في معظم الأوقات. في هذه الدراسة ، اهتمت الممرضات بالسمات التي تسهل عملهم وواجباتهم اليومية. كانت العقبة الرئيسية التي تحد من زيادة استخدام نظام المعلومات الصحية المحوسب هي الافتقار إلى التدريب على كيفية استخدام النظام ، والتخصيص غير الكافي للموارد اللازمة لتحسين النظام الحالي.

الخلاصة: في هذه الدراسة ، اهتمت الممرضات بالسمات التي تسهل عملهم وواجباتهم اليومية. كانت العقبة الرئيسية التي تحد من زيادة استخدام نظام المعلومات الصحية المحوسب هي الافتقار إلى التدريب على كيفية استخدام النظام ، والتخصيص غير الكافي للموارد اللازمة لتحسين النظام الحالي.

الكلمات المفتاحية: سلامة المريض ، المعلوماتية الصحية ، نظام المعلومات الصحية.