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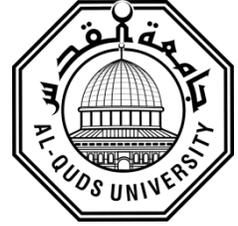
# Users' Perspectives on the Computerized Health Management Information System in the Ministry of Health Hospitals in the West Bank - Palestine

**Mohammad Mahmoud Baniode**

**M.Sc. Thesis**

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# Users' perspectives on the Computerized Health Management Information System in Ministry of Health Hospitals in the West Bank - Palestine

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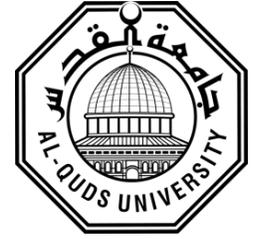
**Thesis Approval**

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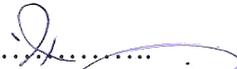
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**Jerusalem – Palestine**

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# Dedication

To Palestine…

*Mohammad M. Baniode*

## Declaration

I certify that this thesis submitted for the degree of master, is the result of my own research, except where otherwise acknowledged and that this thesis - or any part of the same material – has not been submitted for a higher degree to any other university or institution.

Signature……………..

Mohammad Mahmoud Baniode

Date: December 28, 2013

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# Abstract

**Background:** Health Management Information Technology, e-health, is rarely used in the Palestinian health sector. The first pilot initiative in Palestine was implemented in the MoH Rafedia and Darweesh hospitals. However, there is a lack of evidence on the impact of the system and the challenges for the implementation.

**Aim/objectives:** To assess the users' perspectives toward the recently implemented Computerized Health Management Information System (CHMIS) in MoH hospitals and the challenges for implementation from user perspectives. The focus of the assessment was; ease of use (user friendliness), efficiency (time and cost saving), effectiveness (patient safety), Computer Ordering Physician Entry impact on the resources utilization, and extent using system the reports in decision making.

**Methods:** A cross-sectional design was used. All the estimated 500 medical and paramedical staff in the two hospitals was targeted. Data was collected using a self-administered questionnaire.

**Findings:** The overall response rate was 80.5%. 72.1% of the participants were from Rafedia hospital staff and (27.9 %) from Darweesh Nazzal hospital. Almost half of the respondents were males (55.0%) compared to females (45.0 %). Of the total participants 92.8 % (283) are using the system to perform their daily tasks and activities. This shows a high extent use of the system. The general results for the main domains were as follow; ease of use domain (user friendly and usability) was 76.0% of positive responses, effectiveness domain (patient safety and accuracy of documentation) was 73.0% of positive responses, the COPE (rational use of resources and communication speed) was 58.3%, the efficiency of CHMIS (time saving and efficient communication) domain received an overall of (75%) positive responses. The main challenges were (74.0%) limited number of distributed computers in hospital's departments, and the lowest one was (28.0%) trusting in system's capability. T-test and one way-ANNOVA test were used to examine the relationship between dependent and independent variables. Whereas, females scored significantly higher than males toward the ease of use (P<0.001), effectiveness (P=0.007). As for age groups the results show that there is significant association

between the participants' age groups and the ease of use (P<0.001), effectiveness (P=0.05). A relationship was found between profession (physician, nurse, laboratory technicians, radiology technicians, and pharmacists) and study domain at (P< 0.05), where there are significant differences between the following study domains: ease of use (P=0.001), effectiveness (P=P 0. <001), and finally reports using (P=0.042). A strong relationship is found between previous experience of using CHMIS outside the hospitals and study domain at (P< 0.05), where there are significant differences between the following the study domains: ease of use (P=0.001), effectiveness (P=0.001), COPE (P=0.001), and finally efficiency (P=P 0.<001).The highest score was for those who didn't use the system before.


**Conclusions:** Obviously, the results show that using a cutting-edge information technology in managing and monitoring health facilities has a significant effect on the patient's safety, eliminating errors as well as on time saving. In addition it's enhancing evidence-based decision making. However, the main challenges remain to be the lack of equipment and financial resources for the system.

# وجهات نظر العاملين اتجاه النظام الصحي المحوسب المطبق في مستشفيات وزارة الصحة الفلسطينية

**اعداد الطالب : محمد محمود مصطفى بني عودة**

**اشراف : د. معتصم حمدان**

**ملخص الدراسة**

**مقدمة:** تعتبر نظم المعلومات الصحية الالكترونية من التطبيقات قليلة التطبيق في النظام الصحي الفلسطيني. حيث كانت التجربة الاولى للحوسبة الصحية في مستشفيات وزارة الصحة الفلسطينية وبالتحديد في مدينة نابلس—(مستشفى رفيديا الجراحي الحكومي) وفي مدينة قلقيلية (مستشفى د.درويش نزال الحكومي). وتجد الاشارة الى عدم وجود دراسات محلية تثبت فوائد استخدام هذه الانظمة والتحديات التي يواجهها مستخدمو النظام. و تجدر الاشارة الى انه لا يوجد دراسات كافية في فلسطين تثبت اثر تطبيق هذه النظم المحوسبة في تحسين اداء المستشفيات من ناحية السرعة في الاداء وتوفير الجهد و الوقت بالاضافة الى زيادة جودة البانات الطبية والادارية التي تستعمل في اتخاذ القرارات الطبية و الادارية على حد سواء بالاضافة الى الافتقار الى معرفة التحديات الناجمة عن عملية الحوسبة بسبب حداثة دخول هذه الانظمة الى حيز التنفيذ.

**الغاية:** هدفت الدراسة الى تقييم النظام الصحي المحوسب المطبق في مستشفيات وزارة الصحة الفلسطينية من وجهة نظر المستخدمين للنظام، حيث اشتملت محاور التقييم على ما يلي: سهولة الاستخدام والكفاءة (الوقت والتكلفة ) والفاعلية ( سلامة المرضى ودقة التشخيص) كما هدفت أيضا الى دراسة اثر استخدام نظام الطلبات الاليكتروني (COPE) على ترشيد استخدام الموارد المستخدمة وتقليل مستوى الخطأ في تحديد هوية المرضى المطلوب لهم فحوصات. كما تطرقت الدراسة الى التعرف على مدى الاعتماد على النظام المحوسب في صناعة القرار و رسم السياسات بالاضافة الى التعرف على التحديات الناجمة عن الاستخدام.

**المنهجية:** لتحقيق اهداف الدراسة تم استخدام منهجية الدراسة الوصفية – دراسة مقطعية – حيث استهدفت جميع مستخدمي النظام المحوسب من الطواقم الطبية والطبية المساندة والبالغ عددهم 500 موظف، حيث استجاب منهم305. و تم استخدام استبيان مصمم ليجيب عنه مجتمع الدراسة بانفسهم.

**النتائج:** بلغت نسبة الاستجابة للدراسة 80.5% حيث بلغت نسبة الممرضين المشاركين في الدراسة هي 54% و هي الاعلى، وكانت نسبة الاطباء 30.5% من الاطباء والبقية من الخدمات الطبية المساندة. كما و بلغت نسبة الموافقة على سهولة استخدام النظام المحوسب 76% وهي نسبة عالية وايجابية في مثل هذه الدراسة.أما بخصوص محور الفعالية (سلامة المرضى، الدقة التوثيق) فقد حاز هذه المحور على 73% من موافقة المبحوثين وأما كفاءة النظام الصحي المحوسب، فيرى 75% من المبحوثين ان النظام ايجابي و ساهم في تحسين كفاءة تنفيذ الاجراءات و التواصل بين مختلف الاقسام و سرعة اداء المهام. أما بخصوص تأثير نظام الطلبيات الالكتروني للاطباء COPE فقد تباينت اراء المبحوثين في رأيهم

اتجاهه حيث يرون ان هذا النظام يوفر الوقت و يحسن من اليات التواصل بين العاملين  بينما كانت النظرة سلبية حول امكانية النظام من توفير الموارد المستخدمة في عملية العلاج مثل الفحوصات المخبرية والادوية والصور الاشعاعية المطلوبة من خلال النظام. و أما محور "مدى استخدام الاحصائيات والتقارير التي تصدر من النظام في استخدام القرارات" فقد كان ايجابيا بشكل عام 70%. حيث أشارت الغالبية 81% ان النظام يساعد في تتبع وادارة المصاريف بالاضافة للرقابة على الخدمات المقدمة للمرضى. كما أبدى 81% من المبحوثين ان النظام يعزز من تحسين عملية صناعة القرار. اما بخصوص التحديات فقد كان التحدي الاكبر  74% خلال فترة الدراسة هو نقص اجهزة الحاسوب الموزعة في الاقسام. كما أشار 68% منهم ان قلة ساعات العمل وضغط العمل يعتبر تحد كبير اثناء العمل. ثم يليها نقص الدعم اللوجستي المتمثل في الاحبار والصيانة والاوراق. كما توصلت الدراسة الى ان الاناث والفئة العمرية المتوسطة 35-50 و حاملي درجة البكالوريوس والموظفين الذين ليس لديهم خبرة سابقة باستخدام الانظمة المحوسبة كانوا الاكثر ايجابية اتجاه محاور الدراسة.

**الخلاصة:** يظهر جليا أن استخدام النظام المحوسب في ادارة المؤسسات الصحية له اثر ايجابي و يحسن من الاداء  من ناحية توفير الوقت و تقليل الاخطا الطبية و زيادة الرقابة على سير اعمال بالاضاقة الى توفير معلومات موثوقة و ذات مصداقية تحسن من عملية اتخاذ القرارات الطبية والادارية.   وبقي التحدي الابرز هو نقص عدد اجهزة الكمبيوتر حسب وجهة نظر العاملين في فترة عمل الدراسة.

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# List of abbreviations

AHIMA            American Health Information Management Association

AHIMA            American Health Information Management Association

AHRQ             Agency for Healthcare Research and Quality

CHMIS            Computerized Health Management Information System

COPE             Computerized Ordering Physician Entry

CPT              Current Procedural Terminology

DSSs             Decision Support System

EMR              Electronic Medical Record

HCPCS            Healthcare Common Procedure Coding System

EHR              Electronic Health Record

HIMSS            Healthcare Information and Management Systems Society

HIPAA             Health Insurance Portability and Accountability Act

HIS              Health Information System

HIT              Health Information Technology

| | |
|---|---|
| HMIS | Health Information Management System |
| MoH | Ministry of Health |
| PCP | Primary Care Physicians |
| PHIC | Palestinian health Information Center |
| PMR | Paper Medical Record |
| SEHA | Information Technology  systems for Enabling Health Advancement |
| USAID | United States Agency for International Development |
| WHO | World Health Organization |
| IT | Information Technology |
| PCs | Personal Computer |

# List of Annexes

# Chapter One

# Introduction

## 1.1 Introduction

There have been dramatic changes in the development of Health Information Technology (HIT) which began in the 1950s, starting from mainframe computers (centralizing process of data). The health information system (HIS) is considered to be one of the main six building blocks in the health system components. The WHO has addressed the six blocks as a framework to strengthen the health system. These blocks are: service delivery; health workforce; information; medical products; vaccines and technologies; financing; and leadership and governance (stewardship) (WHO, 2010). Strengthening the health system is a strategic aim for the World Health Organization (WHO, 2007). Responsiveness to the rapid changes in the health sector depends on reliable and valid information.

Real-time information is essential for effective and efficient decision making. The U.S.A is spending more than 1.7 billion dollars annually on health care and still suffers from efficiency and safety issues for the care provided (RAND, 2005). Accordingly, the U.S.A. will save seventy seven billion dollars annually if HIT is used in managing patient care. The evolution of using information technology refers to 1950s, where dynamic changes in business environments, which enhanced the health sector with the adoption of HIT (Wikipedia, 2013). The health system is complex and driven by information. The assessment of the implementation of such technologies aims to explore the benefits and challenges from using the new technology. The National Health Information System Strategy 2013-2015 was drawn based on systemic assessment by using Strategic plan guidance tool established by Health Metrics Network (HMN). The strategy focused on improving data management (the process of collecting, processing and analysis), data dissemination and validating public health law and statistics law (MoH, 2012). Meanwhile the current Palestinian Health Management

Information System (HMIS) is characterized as incomplete, fragmented, unreliable, and outdated information.

A newly implemented project was adopted to improve the status of information by using new technologies aimed to automate the medical procedures and protocols used in hospitals and primary health care centers called SEHA project (IT Systems for enabling Health Advancements). The newly implemented system was donated by USAID through the Flagship project (Palestine Investment Conference, 2011). Computerized Health Management Information System (CHMIS) has the potential to improve the efficient and effectiveness of day-to-day transactions, documentation, and accounting for decision makers by using real time data, but in reality it can be measured after using the system. The expected benefits from adopting a CHMIS are summarized in providing reliable and valid data. The adoption of CHMIS will help to better the usage of international standards in performing hospital activities, procedures and protocols, e.g., International Classification of Disease version 10 (ICD), Healthcare Common Procedure Coding System HCPCS, and Current Procedural Terminology (CPT). In addition to linking health statistics with economic indicators, proactive business processes, not only the existing but also the new requirements (Sitting et al., n.d.)The real time, reliable, valid and accurate data are the most important features of data needed for decision making and drawing an effective policy.

In fact, the literature and studies related to the assessment of electronic health information system are rare, but the existing literature and studies highlight the reasons and factors of success CHMIS implementation and the effect of the factors on the final outcome. This thesis aims to highlight user perceptions of implemented systems in order to address the factors that will contribute to the success in future implementations in the Palestinian environment. The traditional system (paper based system) suffers from poor quality of data in comparison with electronic HIS. Health sector stakeholders have a consensus on the importance of the availability of reliable information systems (Abed, 2004).

Historically, the Palestinian health system has been characterized by fragmentation due to political conditions- Israeli occupation. As a result of those conditions, the health information system also has its problems, i.e., availability, reliability and accuracy of data (Mansour, 2012). The health sector review report of 2007 on the health system performance and

challenges in Palestine indicates the weaknesses of the existing health information system. The weaknesses are lack of a uniform registration system and lack of health data dictionary, etc. The health information system's function is not to merely produce some statistics, monitor disease and cost management, and human resources performance, but should also be a strategic tool to provide essential health indicators, e.g., operational, output and outcome indicators. A good health information system ensures that all health information users have access, valid, reliable, and accurate data (Abed, 2007).

## 1.2 Popular Health Information Applications

Some people use the Electronic Medical Record & Electronic Health Record interchangeably. In a study aimed to explore Medical Software terminology usage for EMR and HER, results showed EMR to be different when compared with EHR in terms of software capabilities and definition. In a review of 300 clinical records systems, 207 vendors market their software as an EMR, while 59 use the term EHR (Huston, 2008).

- Health information technology (HIT) is the application of information processing involving both computer hardware and software that deal with the storage, retrieval, sharing, and use of health care information, data, knowledge for communication and decision making (Wikipedia, 2013).
- National Alliance for Health Information Technology define Electronic Medical Record (EMR): EMR: The electronic record of health-related information on an individual that is created, gathered, managed, and consulted by licensed clinicians and staff from a single organization who are involved in the individual's health and care (Herbst et al., 1999). National Alliance for Health Information Technology define EHR: The aggregate electronic record of health-related information on an individual that is created and gathered cumulatively across more than one health care organization and is managed and consulted by licensed clinicians and staff involved in the individual's health and care (Herbst et all., 1999).
- National Alliance for Health Information Technology defines e-PHR: An electronic, cumulative record of health-related information on an individual, drawn from multiple sources that is created, gathered, and managed by the individual. The integrity of the data in the ePHR and control of access to that data is the responsibility of the individual ( Herbst K et al., 1999).

- WHO defines E-health is the transfer of health resources and health care by electronic means. It encompasses three main areas:

- The delivery of health information, for health professionals and health consumers, through the Internet and telecommunications.
- Using the power of IT and e-commerce to improve public health services, e.g. through the education and training of health workers (WHO, 2013).
- The use of e-commerce and e-business practices in health systems management.
- Telemedicine (or telehealth): involves the delivery of health services using ICT, specifically where distance is a barrier to health care. It falls under the rubric of eHealth (WHO, 2011).
- Medical coding is the transformation of narrative descriptions of diseases, injuries, and healthcare procedures into numeric or alphanumeric designations (that is, code numbers) (Wikipedia, 2013).

## 1.3 Problem Statement

Assessment of users' perceptions toward the potential benefits from the implemented CHMIS will enable us to have deep understanding for most of the benefits dimensions and explore most of the weakness dimensions. The research will address clearly and precisely factors affecting success and failure dimensions for gaining benefits from implementing such systems. The necessity for the CHMIS comes from the Palestinian MoH's priority for an effective, accurate and reliable information system, as an alternative for the existing information system (paper-based) (Health Information System National Strategy, 2011). Healthcare providers and authorities in Palestine suffer from the lack of a comprehensive healthcare information system that enables them to manage health services properly. Currently, hospitals and pharmacies use simple, non-integrated software (usually Access or Excel) for patient records. The problem comes from lack of assessment for the users' perspective toward the implemented CHMIS. Our study highlights the perspectives of CHMIS's user toward the implemented system as well as the system's impacts i.e. efficiency, effectiveness, evidence-based decisions and challenges.

## 1.4 Significance and Justification

Studying perceptions of users is not an easy thing. Perceptions differ from one person to the next, based on their socioeconomic background. The Perception is one of the most important aspects of human behavior depending on how we perceive things; we may see the glass either as half-empty or half-full. Accordingly, assessing the users' perceptions toward the implemented CHMIS is the first study in Palestine for the selected hospitals. However, using electronic systems in the Palestinian public hospitals is rare. In addition, there are no existing literature in Palestine that addresses the users' perceptions toward such system in public hospitals. The potential benefits of implementing such a system include decreasing malpractice, basically in clinical documentation and increasing the level of accuracy. The importance of the study can also be represented in improving the health care provided to patients and addressing the weakness affecting the health and well-being. The study will be a base-line study for all future studies in this field. Finally, generalizing the result of the study will give attention and awareness for the stakeholders for a more effective and efficient change in management and improving implementation of such system.

## 1.5 Overall Aim and specific Objectives of the Study

### 1.5.1 Aim

To assess the users' perceptions toward the recently implemented CHMIS in the MoH hospitals in Nablus and Qlaqelia Governorates and the challenges affecting the implementation of the systems.

### 1.5.2 Specific Objectives

1. To assess the users' perceptions toward the ease of use (friendly and usability), efficiency (time, and cost saving), effectiveness (patient safety and accuracy), and Impact of Computerized Ordering Physician Entry (COPE) for implemented CHMIS.
2. To assess the users' perceptions toward the extent using of the system's reports in decision making (i.e., routine statistics and performance reports) and it's reflection on accuracy of data provided by the system.

3. To assess the users' perceptions toward the challenges (technical, financial, management support and competency) for the implementation.

4. To assess the users' perceptions toward the differences in perspectives of system's users in terms of (ease of use, efficiency, effectiveness, challenges, and extent of the use of system's reports in decision making) in relation to the different characteristics (age, education, experience etc.) of the participants.

## 1. 6 Study Assumptions

1. The study used a valid and reliable tool, i.e., the language is clear, and participants understand the statements without any assistance.

2. Duration of experience in using the implemented CHMIS is enough to make these judgments.

3. The study instruments terms and concepts were clear enough to the participants based the pilot questionnaire testing.

# Chapter Two

# Literature Review

## 2.1 Introduction

The literature review in this chapter is organized around three areas: 1) History and type of HIT applications 2) benefits and challenges of implemented HIT applications 3) summary of previous studies.

## 2.2 History and type of Health Information Technologies

Due to the technological advancement that covers all businesses and life aspects, it is worth mentioning the history of HIT before specifying the date of using HIT application in managing health care facilities. It was recently confirmed that the world's oldest health technology was the use of prosthetic devices such as wooden and leather toes, which date back to as early as 950 BC Egypt (Wikipedia, 2012). The National Academy of Engineering indicated the chronological of used and discovered health technologies which was the birth of the x-ray, that sparked a revolution since 1905 (National Academy of Engineering, 2013). Historically, the use of computers and telecommunication technology was not limited to one type of activity; it spreads to cover sport, education, military and health sectors. In the USA, the health information industry has officially been around since 1928 when the American College of Surgeons (ACOS) sought to increase and improve the standards of records that were created in the clinical setting during the diagnosis and treatment of healthcare patients.

However, the 1980s was the start of using computer software and the 1990s was the golden period for development of information technology in hospitals which included laboratory, radiology, pharmacy, etc.(National Academy of Engineering, 2013). However, in Palestine there is no computerized national health information system, as Clinics and pharmacies currently use simple and non-integrated software (excel and access) for point of sale

application and patient record tracking (Palestine Investment conference, 2008). However, the MoH has a sub-electronic system such as those used in pharmacies, primary health care centers and hospitals. In regards to the Palestinian Health Information Center (PHIC), it relies on simple systems such as Microsoft Excel and Access. PHIC has no comprehensive and customized electronic system for collecting, analyzing and disseminating data.

Health care setting is a complex environment. Therefore, evaluation of Information Technology (IT) based applications is also complex work (Rahimi, 2008).Accordingly, there is no one standard model for the evaluation of implemented HIT application. In Fact, the potential outcome from implementing HIT is linked with the study's objectives and aim. While some studies focuses on the users' perceptions, others focus on the impact and cost. The implementing of cutting-edge technology in health facilities is not enough to achieve efficiency, unless the health information system's requirements are matched with organizational characteristics (Rahimi, 2008). Although HIT has existed in the health facilities for three decades, the evaluation of the impact and consequences of that system remains to be a challenge for the decision makers (Rahimi, 2008).

Systematic review studies were conducted by Ammenwerth and Keizer during 1982-2002, where 1035 articles have been selected from PubMed. The authors indicated a high significant increase in the publication in medical informatics. Approximately, 1% from the published medical informatics articles was about evaluation studies (Rahimi, 2008).

This part will explore published studies for evaluation of HIT applications i.e. COPE, CHMIS, EMR, e-health applications, and electronic medical coding. Moreover, this section will shed the light on the criteria used to evaluate the implemented HIT applications.  In general, there is international trend aim to know real effect of implementing new systems on organization's resources. International institutions such as Agency for Healthcare Research and Quality (AHRQ), American Health Information Management Association (AHIMA), American Health Information Management Association(HIMSS), World Health Organization(WHO) are focused on measuring the effect of implementing HIT applications in terms of cost and benefits. For example, HIMSS established a special calculator to measure the cost and benefits of using EMR. The name of the Calculator is (EMR ROI Calculator) which provides an

estimation for expected benefits from using like increase in coding, personnel savings, transcription savings, paper supplies savings, increased capacity (visits), as well as improving resource utilization (HIMSS, 2012). In addition, the EMR ROI calculator provides an estimation for the cost of using EMR such as software and hardware maintenance, and lost revenues (HIMSS, 2012). Efficiency (time and cost savings and quality of information), effectiveness (process integration, organizational Effectiveness (risk management and better care processes), quality of service (continuity of care and the degree of Empowerment of the patient) Clinical Governance (organizational culture, capacity for change as well as overall clinical performance) (HIMSS, 2010). In conclusion, the employed criterion for assessing electronic CHMIS depends on the evaluation aim. While users conduct analysis study to measure financial impact and cost reduction, another will conduct analysis to measure patient safety issues.

## 2.3 Literature Review

### 2.3.1 Local and Regional studies

The most recent study was conducted in Palestinian 2013 was entitled with "Impact of Information Technology and telecommunication on the health care provided in Palestinian health facilities". The study targeted clinical, nursing. The size of the sample population in the study was (403) respondents. The study aims to assess the time, performance, cost and safety achieved as a result of using the system. The study revealed high acceptance for using electronic medical Record in providing care in terms of time saving, minimize cost and performance, and patient safety (Saeed, 2013).

Another local study was conducted in the Gaza European Hospital which aimed to investigate the effects of using computerized health care information systems on administrative and medical decision making, An analytical descriptive methodology was used as secondary and primary data. A Questionnaire was developed by the researcher, and distributed it to a purposive sample which included (140) individuals. The study reveals the following results: Individuals within the administrative and medical sample who use (C-HIS) were 121, composing 94.5% of the sample. That indicates a high percentage of usage within

administrative and medical tasks, the descending order of the degree of usage of kinds of (C-HIS) in administrative and medical departments, is as follows: Functional information systems, Office Automation systems, management information systems & decision support systems, Messaging systems, and business intelligence systems. The study showed that a computerized healthcare information system is currently used by the European Gaza Hospital and has positively impacted the medical and administrative activities as well as the medical and administrative decision making process. The study showed that there are barriers that limit the effectiveness of (C-HIS), including: Lack of financial support, lack of providing adequate training, lack of vision concerning the need for comprehensive and long-term planning of e-health application (Dweek ,2010).The study showed that there are barriers that limit the effectiveness of CHMIS including: Lack of financial support, lack of providing adequate training, lack of vision about the need for comprehensive and long-term planning of e-health application. The study recommended strengthening the strategic vision concerning the need for comprehensive and long-term planning of e-health applications, and making e-health of the top national priorities and the necessity to build a nationwide integrated electronic health system, linking hospitals by computerized health information systems (Dweek M, 2010).

Another local study was conducted in the Gaza Strip to assess the used HMIS in Gaza's Hospitals. The data was processed by computer using the SPSS package, means, standard deviation, T-Test, One way ANOVA, F-Test, and correlation coefficients were calculated. 156 participants were responding to the questionnaire distributed on four health facilities. 74% of participants showed positive perceptions toward using an electronic system in managing health facilities. In addition to the easiness of retrieving data and the easiness of exporting of reports, the study also found a relation between positive perceptions and high education. In addition, people of an older age have a significant relation with the positivity of users' perceptions toward using HIT application in performing business activities (Al.Shurafa, 2004). Al.Shurafa recommended increasing improvement of used infrastructure, increase availability of sufficient resources for the continuity of such a system, and finally involved system's users in decision making and improving of the used system.

In 2006 a study conducted in the North of Jordan at a teaching hospital aimed at describing physicians' use, perceptions, and knowledge regarding the implemented CHMIS using a descriptive survey design was used. An investigator-developed questionnaire comprising of 38 questions was distributed to a convenient sample of 29 staff physicians who practiced in the hospital in the periods before and after the implementation of the system. The results indicated that staff physician's see the system improving access to information, the system is easy to use, and improves the quality of provided care (Hayajnhe, 2006).

A study conducted at the King Abdul-Aziz Medical City in Saudi Arabia aimed to assess the perceptions of healthcare providers towards health information technology applications in terms of benefits, barriers, and motivations. A sample size of 623 was drawn from a population of 7493 healthcare providers using a convenience random sampling method. Results indicated that the majority of healthcare providers use KAMC health information applications. The majority of healthcare providers perceived that the applications are valuable and beneficial (Abeer, 2010).

## 2.3.2 International Studies

HIT aims to improve health care quality, reduce cost growth, stimulates innovation and protect privacy (Market Foundation, 2009). The Published studies in the health information industry divides most of the problems in evaluating HIMS into three main areas: (a) the methodological approaches employed to capture the effect of CHMIS implementation and use, (b) the challenges and problems involved with the implementation of an integrated electronic patient record system, (c) the key factors which influence the implementation of CHMIS (Rahimi, 2008).

Easiness, user acceptance, and usefulness are criterions used to evaluate HIT Application as one success factor for implementation of HIT applications (Seddon, 1997), (Johnson et al., 2001).In a study conducted by Shannon H. Houser  entitled with Perceptions regarding electronic health record implementation among health information management professionals in Alabama: A Statewide Survey and Analysis" the study aim to  assess the status of implementation of EHRs among Alabama hospitals and the factors effect implementation  and benefits of, barriers to, and risks of EHR implementation. 93 of respondents indicated to

benefits gains from the implemented system i.e. improving workflow, reducing of medical errors 67% reducing medical treatment time and cost 43% increasing revenues. As for barriers, 75% lack of adequate funding and resources, another lack of structured technology and lack of employee training. Implementation and interpretation of the Health Insurance Portability and Accountability Act (HIPAA) and other privacy issues were also noted as barriers ( Shannon H. Houser, 2008).

In a study conducted in Taiwan were assessed 12,560 consultations in the PMR period and 12,669 consultations in the EMR period by 33 different doctors. The results  showed significant relation between using EMR and increase clinic efficiency among patients seen by doctors of physician , majority of participants felt that processing of transactions is faster and easier than paper. Quantitative and qualitative methodologies were used to assess participant's perception toward the difference between paper and electronic system. The study aims to evaluate changes in efficiency and quality of services after the introduction of a purpose built EMR system, and to assess its acceptability by the doctors, nurses and patients using it. Method as to compare a nine month period before and after the introduction of an EMR system in a large sexual health service audited a sample of records in both periods. In addition to provides survey for patients and staff. The results show 9,752 doctor consultations (in 5,512 consulting hours) in the Paper Medical Record (PMR) period and9, 145 doctor consultations (in 5,176 consulting hours in the EMR period eligible for inclusion in the analysis. There were 5%more consultations per hour seen by doctors in the EMR period compared to the PMR period. The study revealed that introduction of an integrated EMR improved efficiency while maintaining the quality of the patient record. And the EMR was popular with staff and was not associated with a decline in patient satisfaction in the clinical care provided (Christopher. Fairley et al., 2013)

A survey was focused on health information technology HIT capacity was administered to all hospitals in Iowa. Structured interviews were conducted with the leadership at 15 critical access hospitals (CAHs) that had implemented EMRs in order to assess the perceived benefits of operational EMRs. The results indicate that most of the hospitals implemented EMRs to improve efficiency, timely access, and quality. Many CAH leaders also viewed EMR

implementation as a necessary business strategy to remain viable and improve financial performance. While some reasons reflect external influences, such as perceived future federal mandates, other reasons suggest that the decision was driven by internal forces, including the hospital's culture and the desires of key leaders to embrace HIT. Anticipated benefits were consistent with goals; however, realized benefits were rarely obvious in terms of quantifiable results. These findings expand the limited research on the rationale for implementing EMRs in critical access hospitals. (Troy, Mills et al., 2010).

The study aim to investigate how faculty, residents, and both clinical and nonclinical staff view the effects of EHR implementation on a broad range of issues.72 personnel were surveyed on two different periods after implementation of HER. Overall perceptions were Perception of all personnel was that the EHR was having a negative effect on patient care. There was no detectable statistically significant change between the 8- and 12-month surveys. The study revealed into the   perception of the promised improvement in patient care, provider communications, and billing efficiency due to EHR implementation was not realized in this population. (Michael. Bloom & Mark.Huntington, 2010).

A study entitled with "A Framework for Predicting EHR Adoption Attitudes: A Physician Survey" it's aimed to the study aim to determine the individual characteristics and the social and technical factors that may contribute to physician acceptance of EHRs. One of criterions used to measure successful of using CHMIS is to measure adoption percentage as an indicator for measuring of users' acceptance. The study measures the effect of set of variables on the adoption Management support, physician involvement, adequate training, physician autonomy, doctor-patient relationship, perceived ease of use and perceived usefulness attitude about EHR usage. The results show as a physician's perception of the EHR's ability to inhibit the doctor-patient relationship increases, his or her perceived ease of use decreases. Physician involvement also had significant total effects on perceived ease of use, while adequate training was not found to be statistically significant. Perceived ease of use had the strongest total impact on perceived usefulness. Doctor-patient relationship had a significant negative influence on perceived usefulness, again due to the negative content of questions in the doctor patient relationship construct. Management support, physician involvement, and adequate

training had minimal overall impact on perceived usefulness. Perceived usefulness had the strongest impact on attitude about EHR use, with physician involvement, perceived ease of use and doctor-patient relationship making noteworthy contributions. Perceived ease of use did not directly impact attitude about EHR use as hypothesized (Mary et al., 2009).

A study entitled with "Health Information Technology and Physician Career satisfaction". The study aims to assess the association between key forms of HIT and career satisfaction among primary care physicians (PCPs) and specialty physicians. The study show Physicians who used five to six (odds ratio [OR] = 1.46) or seven to nine (OR = 1.47) types of HIT were more likely than physicians who used zero to two types of HIT to be "very satisfied" with their careers. Information technology usages for communicating with other physicians (OR = 1.31) and e-mailing patients (OR = 1.35) were positively associated with career satisfaction. PCPs who used technology to write prescriptions were less likely to report career satisfaction (OR = 0.67), while specialists who wrote notes using technology were less likely to report career satisfaction (OR = 0.75). The study revealed into using more information technology was the strongest positive predictor of physicians being very satisfied with their careers (Elder. et al., 2010

The study was aimed to examine the impact of electronic health records (EHRs) on documentation time of physicians and nurses and to identify factors that may explain efficiency differences across studies. The result indicated into benefits of using electronic system in managing health services which revealed into saved nurses, respectively, 24.5% and 23.5% of their overall time spent documenting during a shift. Using bedside or point-of-care systems increased documentation time of physicians by 17.5%. Saved nurses, respectively, 24.5% and 23.5% of their overall time spent documenting during a shift. Using bedside or point-of-care systems increased documentation time of physicians by 17.5%. In comparison, the use of central station desktops for computerized provider order entry (CPOE) was found to be inefficient, increasing the work time from 98.1% to 328.6% of physician's time per working shift (weighted average of CPOE-oriented studies, 238.4%). The study revealed decreased documentation time in an EHR project is not likely to be realized. It also identified how the selection of bedside or central station desktop EHRs may influence documentation time for the two main user groups, physicians and nurses ( Poissant et al., 2012).

Zurovac's study was aimed to understand patients' perceptions of EHRs, including their effect on the patient-provider relationship, quality of care, and views toward data security and confidentiality. Patients had favorable perceptions of EHRs. Most believed that EHRs improved the quality of care and most were not concerned with confidentiality of records. Adopters' patients rated the quality of care higher than non-adopters' patients. Survey results showed no detrimental effect of EHR use on patient-provider communication and no relationship between the way in which physicians interacted with the computer and patients' perceptions of care. Transition issues did not affect patient satisfaction (Zurovac, 2012).

A master thesis was conducted in Dublin University at UK to evaluate the performance of a local EHR Electronic Client Record System (ECRS) from the point of view of clinical users who provide a service for people with intellectual disabilities. The research compares pre-trained EHR users' level of benefit realization expectations before they use the system and their subsequent perception level of benefit realization after a few months of using the EHR system. The research showed that users maintained a high level of benefit realization expectations at the end of data collection period. However participants also expressed dissatisfaction with the current level of performance of the EHR. The researcher designed and described a model based on reviewed literature to explain the research results (Muvungani C, 2012).

Mbananga and colleagues (2002) study was aimed to assess how the CHMIS had met its objectives and to provide lessons that can be learned from this evaluation process. Both quantitative and qualitative methods were used in collecting data. The quantitative findings of the study revealed that there were no changes observed in the median time spent by patients in implemented hospitals. The qualitative results indicated that there were positive changes in the work of OPD clerks which might resulted in a reduced median time spent by patient. The CHMIS has potential to changing and improving the work of registration and admission of patients. Clerks reported that the system improved their work in the areas of retrieving returning patient's records and in checking the accuracy of the information provided by the patients in the second visit (Mbananga et al., 2002).

**2.4 Conclusion**

By reviewing the related studies we found out study's dimensions are consistent with published studies. Other study's dimensions were inconsistent with related published studies. The points below are summarized all consistent and inconsistent results:

1. Through reviewing the published studies in assessment of electronic HIMIS we found that results show positive perceptions toward using electronic systems in managing health care facilities which is consistent with our study's results.

2. Our study is similar to other published studies for the challenges factors of implementation such as; technical, financial, and change management challenges.

3. Our study's variables were different than other published studies where it's focused on specific variables of users' perceptions which differ than other studies that focused on coverage rate, Return on investment, and cost-effectiveness.

4. Our Study was distinguished in the context and targeted functional areas, where we assessed National CHMIS not sub-system like in Jordan, Saudi Arabia Kingdome and Gaza Strip.

5. In our study we used cross-sectional methodology which is similar to internal and regional study, except those used Pre and after implementation assessment.

6. The study was differing than local studies (Dweek study in European Gaza Hospital and Saeed's study in West Bank Hospitals) which focused on users' perceptions such as patient safety and (COPE) rather than effects and study's variables.

7. Our study was similar to international, regional and local study in main findings such as high acceptance of using system and positive perceptions toward electronic system.

8. The literatures also had shown the importance of these systems in achieving good governance and health reform.

9. The literatures also shown that adoption of CHMIS is one of the new trends in managing health facilities.

# Chapter Three

# Conceptual Framework

## 3.1 Introduction

This chapter explores the operational definitions for dependent and independent variables that may affect users' perceptions toward the implemented CHMIS. The selected variables are considered as a blueprint guide for the research process. The conceptual framework model was developed after reviewing the previous literatures that are related to same research topic. This study was based on a quantitative statistical assessment of the impact of implementing CHMIS on hospital performance from users' perspectives. It should be indicated here to the influence of newly implemented such system in public hospital, where the culture of accepting new technology was affected with the change management process.

## 3.2    Operational Definition

### 3.2.1 Perception:

Previous research work dealing with the perceptions of users has led to a number of useful models, but these models are not necessarily appropriate in all situations. Further, we must try to understand how specific attributes relate to the perceived success of the CHMIS and this is not always possible with previous models. However, the adopted model in our study wad build based on the study's dimensions and previous studies. The perception define as: the organization, identification, and interpretation of sensory information in order to represent and understand the environment (Daniel, 2011) In our study we used the term of perception to explore and magnify users' views toward the implemented system.

### 3.2.1  Ease of Use of the CHMIS (Usability)

The ease of uses is defined as: The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use" (Quesenbery, 2001). Another definition: Is the ease of use and learnability of a human-made object (Wikipedia, 2012). The object of use can be a <u>software application</u>, website, book, <u>tool</u>, <u>machine</u>, process, or anything a human interacts with (Wikipedia, 2012). In <u>human-computer interaction</u> and <u>computer science</u> and usability studies the elegance and clarity with which the <u>interaction</u> with a computer program or a web site (<u>web usability</u>) is designed (Wikipedia, 2012). Usability differs from user satisfaction insofar as the former also embraces "usefulness" (Wikipedia, 2012).   A more precise definition can be used to understand user requirements, formulate usability goals and decide on the best techniques for usability evaluations (Quesenbery, 2001). In our study we used "Ease of use" as a dependent variable to measure the ability of using systems regardless of experience and education level, correcting wrong transactions, and time consuming in documentation. Five items were used to measure this dimensions which represented in table number (3.1).

## Table (3.1): Ease of use domain and corresponding items

| Domain 1: Ease of  Use |
|---|
| 1.  I can use CHMIS easily regardless to my years of experience and education level. |
| 2.  CHMIS is easier than paper-base system in terms of documentation and communication. |
| 3.  CHMIS pop up warning messages reducing wrong transactions. |
| 4.  Correcting wrong transactions such as (Miss spelling, Data Entry, and Orders) can be done easily through CHMIS. |
| 5.  Frequent use of CHMIS contributes in reducing false entries. |

### 3.2.2  Effectiveness

The investment in health IT management focused on providing health care quality, reducing growth in cost, stimulating innovation, and protecting privacy (Markel Foundation, 2009). These goals consider effectiveness needed from implementing CHMIS.  Effectiveness is the accuracy and completeness with which a user can achieve task goals (HMISS, 2009).  Some

measures used in effectiveness, i.e., number or rate of errors, path taken to complete task, severity of errors, and request for help (HMISS, 2009). The effectiveness perceptions defined as: the capability of producing a desired result.  When something is deemed effective, it means it has an intended or expected outcome, or produces a deep, vivid impression (Wikipedia, 2012). Effectiveness is the completeness and accuracy with which users achieve specified goals.  It is determined by looking at whether the users' goals were met successfully and whether all work is correct (Quesenbery, 2001) The effectiveness in our study measured the ability of the system to achieve patient safety  by minimizing malpractice, reducing wrong orders, and enhancing the health services outcomes in the implemented facilities (Rafedia and Darweesh Nazzal Hospitals). Where there were 8 questions constructed to measure users' perspectives toward the effectiveness items. The selected items are represented in table number (3.2).

**Table (3.2): Effectiveness domain and corresponding items**

| Effectiveness |
|---|
| 1. CHMIS contributes in promoting patient safety culture. |
| 2. CHMIS contributes in reducing male practice in terms of diagnoses and treatment. |
| 3. CHMIS improves accuracy compared with hand- writing. |
| 4. CHMIS reduces Male practice resulted from lack of line clarity in comparison with hand-writing. |
| 5. CHMIS helps in determining patient's identity in terms of: Full Name and ID Card No which helps in reducing errors in ordering lab tests, medications and therapeutic procedures accurately. |
| 6. CHMIS reduces the occurrence of errors in drug ordering by showing drug interactions and contradictions |
| 7. CHMIS improves data safety and medical information and protects data from being lost. |
| 8. CHMIS empowers accurate diagnoses by using international classification of diseases (ICD 10) which improves and increase safety of given diagnoses and treatment. |

### 3.2.3 Computerized Order Physician Entry impact (COPE):

Sometimes referred to as COPE is a process of electronic entry of medical practitioner instructions for the treatment of patients (particularly hospitalized patients) under his or her care. These orders are communicated over a computer network to the medical staff or to the departments (pharmacy, laboratory, or radiology) responsible for fulfilling the order. (COPE) decreases delays in order completion, reduces errors related to handwriting or transcription, allows order entry at point-of-care or off-site, provides error-checking for duplicate or incorrect doses or tests, and simplifies inventory and posting of charges. Although manufacturers use the term Computerized Physician Order Entry, a more accurate term would be Computerized Prescriber Order Entry or Computerized Pharmacist Order Entry. Order Entry is in the domain of the pharmacist because it is the pharmacist's responsibility to verify any entry into the system concerning the use of medications within the hospital or health care system. Order clarification requests will be enhanced by improved communication and collaboration amongst the health care team (Wikipedia, 2012)**.** Therefore; in our study we used (COPE) to measure the perception of all paramedical staff to explore the benefits and losses as a result of using (COPE). Accordingly; seven items were used to measure this dimensions which represented in table number (3.3).

## Table (3.3): (COPE) domain and corresponding items

| Computer Physician Order Entry  (COPE) |
|---|
| 1.   CHMIS contributes in patient's safety in terms of reducing errors in medications. |
| 2.   CHMIS contributes in reducing time between Paramedical departments. |
| 3.   CHMIS contributes in reducing the laboratory, Pharmacy and radiology requests. |
| 4.   CHMIS reduces the unnecessary and repeated test. |
| 5.   CHMIS contributes in determining the necessary tests and medication accurately compared with paper based. |
| 6.   CHMIS facilitates the process of communication and arrangements between physicians and paramedical departments (Laboratory, Radiology and |

| Pharmacy). |
| 7. CHMIS increases the patients' satisfaction from the services. |

**3.2.4 Efficiency:** Efficiency as test metric is the speed which a user can successfully accomplish the task at hand (HMISS, 2009). The efficiency is defined as the extent to which time, effort or cost is well used for the intended task or purpose. It is often used with the specific purpose of relaying the capability of a specific application of effort to produce a specific outcome effectively with a minimum amount or quantity of waste, expense, or unnecessary effort. "Efficiency" has widely varying meanings in different disciplines (Wikipedia, 2012). Some measures used in efficiency of electronic systems, i.e., time to perform particular task, or time to execute a particular set of instructions (HMISS, 2009). In our study we used 6 statements to measure users' perceptions toward the system's effect on the time saving in staff communication, and speed of accessing patients' information. The selected items for these dimensions are represented in table number (3.4).

**Table (3.4): Efficiency domain and corresponding items**

| Efficiency of the Computerized HMIS |
| 1. CHMIS reduces time spent in diagnoses and documentation. |
| 2. CHMIS contributes in the process of filling out forms and meets the necessary information from patients easily. |
| 3. CHMIS facilitates the process of communication and arrangements between different staff member (Medical, Medical Support and Administrative etc….) |
| 4. CHMIS facilitates the process of communication and arrangements between different departments (Medical, Paramedical and Administrative etc….) |
| 5. CHMIS contributes in accessing medical registry very easily. |
| 6. CHMIS prevents data and patients documents from loss. |

## 3.2.5 Extent of use of CHMIS's reports in decision making

Availability of valid and reliable information is essential for effective decision making. Effective decision making is relying on availability of information choices, which enable detecting problems, defining priorities, identifying innovative solutions, and allocating resources for improved health outcomes. Decision making is a cognitive process resulting in

the selection of a course of action among several alternative scenarios. Every decision making process produces a final <u>choice</u>. The output can be an action or an opinion of choice (Wikipedia, 2013) Studies in HIT show an importance for using HIT applications in decision making (Hayajnhe, 2006) Clinical setting organizations are information based. Health organizations are complex environment which make availability of information critical in decision making. Decision Support System (DSS) serve the management, operations, and planning levels of an organization and help to make decisions, which may be rapidly changing and not easily specified in advance.  DSS can be either fully computerized, human or a combination of both (Wikipedia, 2012).In our study we used 11 items to measure users' perceptions toward the benefits gained from reports and statistics provided from the CHMIS, which represented in table number (3.5). Statements are positively worded highlighting the system's capability in building effective decisions, corrective actions and enhancing hospital performance.

**Table (3.5): Extent use of CHMIS' reports domain and corresponding items**

| Using system reports in decision making |
|---|
| 1. CHMIS contributes in reducing employee's efforts in performing every day duties and employed it in a creative work. |
| 2. CHMIS helps in developing employees analytical and technical skills through reports and information generated by the system. |
| 3. CHMIS helps in the process of organizing and distributing tasks (Roles and Responsibilities). |
| 4. CHMIS helps in issuing administrative reports |
| 5. CHMIS assist in computing the cost of services provided by hospital |
| 6. CHMIS contributes in raising work and employees efficiency in terms of accuracy, time saving |
| 7. CHMIS facilities communication between departments when making decisions |
| 8. CHMIS helps in saving the efforts of information gathering to make decision and present alternatives |
| 9. CHMIS provides essential information in right time to be used in decision making |
| 10. CHMIS provides the necessary data that needed for decision making |
| 11. CHMIS enhances from the quality of decision making |

### 3.2.4 Challenges and barriers

Challenges and barriers are categorized into pre-implementation and after implementation. Accordingly; during-implementation includes initial hardware and software costs. In addition to change and redesign workflows, staff training, provision of IT support, and limited interoperability. A systematic review was conducted by Adam Baus to explore and specify main challenges on using and implanting HIT applications (Baus, 2004). Accordingly, Baus's Study revealed 5 categories of challenges affecting implementation of HIT applications. Challenges are usability, leadership, organizational structure change, technology, training and technical support. In our study we used 9 items to measure users' perceptions toward the barriers facing users during the implementation phase, which represented in table number (3.5). We limited barriers on technical, financial, training, change management, and logistics challenges.

**Table (3.6): Challenges domain and corresponding items**

| Challenges of Implementing CHMIS |
|---|
| 1. Limited number of PCs in departments compared to the workload |
| 2. Lack of Knowledge and skills in using CHMIS |
| 3. Lack of confidence and capabilities of CHMIS. |
| 4. Lack of awareness and Knowledge of the importance and usefulness of CHMIS |
| 5. Lack of training for the staff to use CHMIS |
| 6. Lack of support and empowerment from Management in terms of (reinforcement, monitoring, orientation, etc….) in the implantation of CHMIS. |
| 7. Lack of financial resources to update CHMIS |
| 8. Insufficient time for using CHMIS Due to workload and lack of staff. |
| 9. Lack of logistics such as (Stationary and Ink) that support the sustainability of CHMIS. |

**Graph (3.1): Conceptual Framework**

**Independent Variables:**

- Age
- Gender
- Education
- Experience
- Position
- Computer Literacy
- HMIS Experience
- Extent use

**Domains:**

| Ease of Use | Efficiency |
|---|---|
| Effectiveness | COPE |

Using System's reports in decision making

**Implementation Challenges**
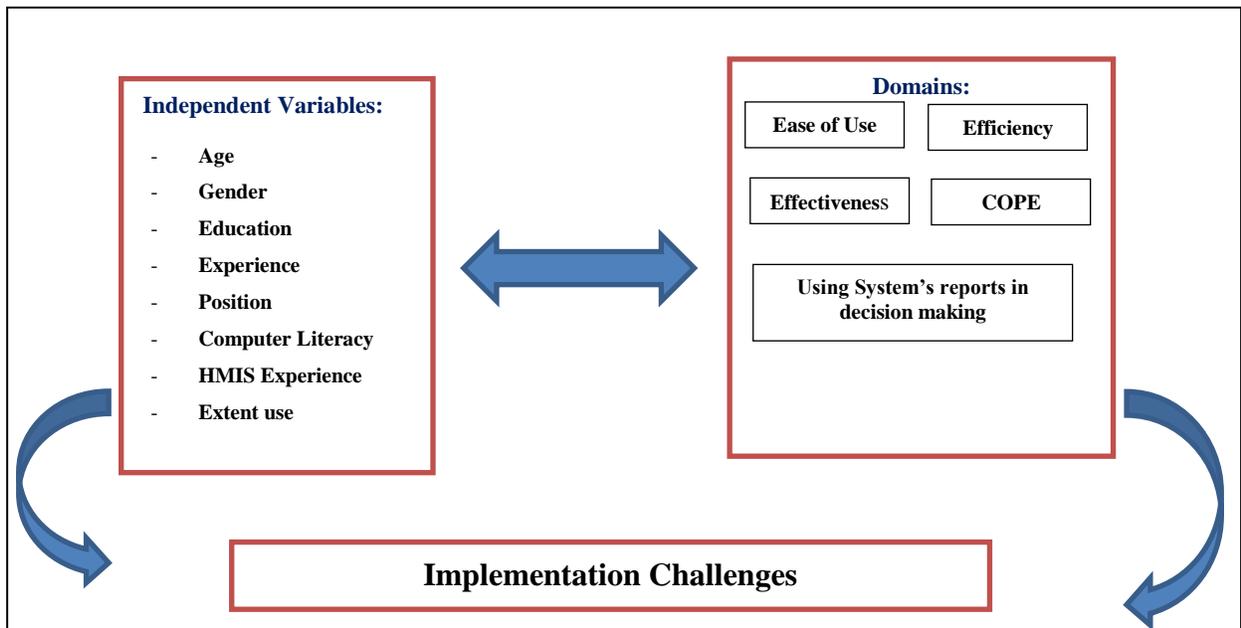
Previous studies showed the effect of independent variables on assessment of users'

Perceptions toward using HIT applications. Accordingly, we selected some independent Gender, age, education, experience, computer literacy, experience in using HIT applications, and specialty. Hayajneh's study in Jordan used physicians' ages, specialty, years of practice and years of practice at the study hospital in the implemented hospital (Hayajnhe, 2006). Abeer's study in SAK used age, gender, education, work experience, and occupation. Finally Musbah's study which was conducted in Palestine – Gaza City selected education, experience, and extent of use of CHMIS in daily work, management support, training, and availability of PCs, financial support, and type of information systems (Musbah, 2010).

In our study we selected most important independents variables which included:

▪ **Gender:** Categorized into male and female respondents.

▪ **Age:** Categorized into three groups; 20-35, 36-50, and over 50 years.

▪ **Educational level:** It's represented by the level of education of the respondents. It was categorized into three groups: diploma, Bachelors and post-graduate.

▪ **Position:** It's represented by the profession of the respondents. It was categorized into two groups: medical staff (physicians, nurses) and paramedical staff (pharmacists, laboratory technicians, and radiology technicians).

- **Years of experience in current facility:** This referred to the duration of service within the current hospital. It was categorized into three groups: less than 1 year, 1-5 years, and more than 5 years.
- **Previous experience of using HIT application:** It represents past experience of the user in using HIT applications.

# Chapter Four

## Methodology

### 4.1 Introduction

This chapter describes the research design, sampling methodology, ethical considerations, instruments, validity & reliability of the instruments, pilot study, data collection method, data analysis, and summary.

### 4.2 Research Design

To achieve the objectives of the study; a non-experimental, quantitative, cross-sectional descriptive design used to identify the users' perspective toward the implemented CHMIS. The cross-sectional designs involve the collection of data at one point of time. Users' perspectives were captured during the time of implementation. The study was conducted during the period between May and June 2012.

### 4.3 Study Setting

The study was conducted in two hospitals; Rafedia Surgery Hospital in Nablus and Darweesh Nazzal Hospital in the Qalqelia governorate.

- Rafedia Hospital (213 beds, average length of stay was 2.2 days, and the occupancy rate was 80.9%) working as referral hospital (surgical and educational center).
- Darweesh Nazzal is surgery and internal disease hospital (56 inpatients beds, average length of stay 1.4 days, and occupancy rate 60.0%) (MoH, 2012).

### 4.3 Study Population and sample

The population of the study consisted of all licensed physicians, nurses, and paramedical staff (laboratory technicians, radiology technicians, and pharmacists) working in the two MoH hospitals. Outpatient nurses were excluded, because they didn't use the CHMIS in their daily tasks. The total number of the population was estimated at (500).

The inclusion and exclusion criteria were as follow:

    A. Staff has used the CHMIS for at least one month.

    B. Licensed and registered employees were included.

    C. The trainees or students were excluded.

It is worth noting that Alia Government Hospital and the Palestinian Medical Complex PMC were excluded from the study because the implementation of the system had just started when we started the study. The inclusion of the hospitals was one year after introducing the system.

## 4.4 Ethical Consideration

The research review board at the School of Public Health approved the research proposal. Permission to conduct the study in the targeted public hospitals was provided by the Ministry of Health and General Directorate of Hospitals (Annex5, 6). An informed consent was attached to the questionnaires. Participants were given full explanations about the research, including the purpose, nature of the study and importance of participation. In addition, participants were assured confidentiality of information and voluntary participation, and were given total freedom to accept or reject participation in this research (Annex 3, 4)

## 4.5 Survey Instrument

The adopted survey instruments were two self-administrated questionnaires, one for medical staff (doctors and nurses) (Annex1). Another questionnaire was for paramedical staff (laboratory technicians, radiology technicians, and pharmacists) (Annex 2). They were similar in all items except the COPE domain that was dedicated for paramedical staff. Two questionnaires were developed after extensive review of the literature (Musbah, 2011), (Hayajnhe, 2006), (Abeer, 2011), and (AHRQ, 2006). Both questionnaires were prepared in Arabic to be more understandable by the participants. The tool was not adapted in any study, but some questions were selected from Musbah's tool i.e. General Information: Question # 13. Efficiency domain: question # 2, 6 and 3. Challenges domain: question # 1, 3 and 4. Domain of systems' reports: Question # 1 and 2. As for the rest questions are derived from the reading different literatures and previous studies related to HIT benefits and challenges like Abeer, Hayajnhe, HMN Assessment tool formulated by WHO.

(Musbah, 2011). However, our tool was built to serve the study's objectives and wasn't used before. The questionnaires were divided into 6 sections, where the first section provided a general demographic users description, such as, age, gender, education, experience, etc. The second part was designed to assess the rest of the study variables, i.e. ease of use, efficiency, effectiveness, decision making, and challenges, where these variables included 34 statements. These domains included statements that requested the participants to rate their agreement by using the 5-point Likert scale, ranging from, " Strongly agree" (1), " Agree " (2), " Neutral" (3), " Disagree " (4), " Strongly Disagree" (5)

## 4.6 Validity

After developing both questionnaires, it was sent to group experts to determine whether the items in the questionnaires were relevant and suitable to the purpose of the study.(Annex 7) The comments of the experts were about the design, layout of the questionnaire form, and some comments on the context and terms used. After receiving all comments – based on a certain form – we responded accordingly and modified the questionnaires. On the other hand, the readability and clarity of technical terms used were given concerns from the targeted test participants, since the IT terms are new and not well known to the medical staff, which caused the pilot phase to have significant effect on the questionnaire format and context.

## 4.7 Reliability

According to Polit and Beck, the reliability of quantitative instrument is "a major criterion for assessing its quality and adequacy" (Polit and Beck, 2004).The reliability of the tool in this study was estimated using Cronbach's alpha coefficient (Cronbach's alpha). The Cronbach's alphas for the study domains were as follows: ease of use (Cronbach's $\alpha=0.74$), effectiveness (Cronbach's $\alpha=0.84$), COPE (Cronbach's $\alpha=0.88$), efficiency of the CHMIS (Cronbach's $\alpha=0.83$), main challenges (Cronbach's $\alpha=0.83$), and using system reports in decision making (Cronbach's $\alpha=0.89$).

## 4.8 Pilot Study

Pilot testing was conducted before distributing the questionnaires. Both questionnaires were tested and validated to assure understandability and clarity of the presented concepts, clarity of the statements, and adequacy of the representation of the basic variable categories. Ten clinical and paramedical staff was asked to fill the questionnaires to examine the clarity of the Questionnaires. The gathered data from the pilot phase (Darweesh Nazzal and Rafedia hospitals) were not included in the main study. The feedback received after conducting the pilot study was exploited to finalize and amend both questionnaires.

## 4.9 Data Collection Method

Self-administered questionnaires were distributed to the employees satisfying the inclusion criteria in the two targeted hospital. The questionnaires were distributed by the researcher after getting approval from the MoH side (Annex6). The participants were gathered all filled questionnaires at the collection point in each department. We would like to point out that 6 surveys were not completed or not filled out completely.

The researcher distributed the questionnaires to the study group in the hospitals under study over a week. The researcher began with Rafedia Government Hospital, then the Qalqiliya Hospital. The researcher divided the hospital into sections (Inpatient, Outpatient, Laboratory, Radiology, and Pharmacy). Then the researcher distributed the questionnaire to the staff and requested them to submit the filled out questionnaire at the nursing station, which was designated as collection point for filled out questionnaires. The hospital staffs were comfortable with this arrangement. As such the researcher used to distribute the questionnaire and visit the nursing station to collect the questionnaires, and distribute more questionnaires for the ongoing shift. This process continued for a week in both the hospitals in order to ensure coverage of employees of different shifts.

On being questioned about the average time required to fill out the questionnaire, the answer was that it required five to seven minutes. The biggest challenge to filling the form was work pressure on the staff which would lead to postponement of the filling of forms in some cases. Holidays are also considered as major hurdles as some employees in the study group could not

be covered. It is notable that the hospital administration was supportive of the researcher by allowing him to move freely in the hospital as per the hospital policies like working during the visit hours only, wearing protective gloves, medical, shoe covers during visits to medically isolated areas like operation theatres, and ICUs. The respondents showed much interest in knowing the results of the study upon its completion. They also hoped that further studies on the rationing of consumption level and controlling expenditure in the hospital would be carried out.

## 4.10 Data Analysis

Response scores were converted from 5-Likert to a 100-point scale using the Scale computation instructions (SAQ). Mean items and scale scores were calculated. Then a composite score equivalent to the arithmetic mean of the scale scores was also calculated. In order to identify areas of strength or areas for potential improvement, the percentages of positive responses for the survey scales and items were calculated. Positive responses in positively worded survey items were 'agree/strongly agree' and in negatively worded items were 'disagree/strongly disagree'. The percentage of positive scale scores were computed by finding the average of the percent positive response on the items within each scale/ domain. Univariate analysis was used to test associations between composite patient safety scores and different respondent characteristics. A two-tailed P value <0.05 was considered statistically significant. Data was entered and analyzed using IBM-SPSS version 19.

It is important to mention here that six surveys were excluded for the following reasons:

1. Less than one entire section of the survey was completed or not completely filled out.

2. Fewer than half of the items throughout the entire survey (in different sections).

3. All ratings were same for all items, which were considered a type of bias.

## 4.12 Study Limitations

It was not possible to reach staff on leave, e.g., maternity, sick leave, and vacations in all departments during the period of implementation in Rafedia hospital and Qalqelia.

1. Population Limitation: limited number of hospitals that implemented the CHMIS at the time of the data collection; two hospitals (Rafedia Surgery Hospital and Dr. Darweesh Nazzal Hospital.

2. Sample Limitation: Study focused only on the users has at least three months of using the system medical, nursing, and paramedical staff. Administrative and support services were not included.

3. Inability to include participants who were on leave during the data collection period.

4. The self-administered questionnaire as it is regarded as an impediment in itself

5. Users' characteristics : including only the who have more than one month experience in using the system during the implementation period

# Chapter Five

# Results & Findings

## 5.1 Introduction

This chapter presents the findings and results of the survey. The first section discusses characteristics of the respondents' socioeconomic status and the use of computers in the workplace. Section two statistically presents the results of the HMIS questionnaire including the following: mean scores, standard deviations, and percentages of positive responses toward the study domains The third section presents a bivariate analysis of the dependent variables (the study domains) and participant's characteristics (the independent variables: gender, education, experience, etc.).

## 5.2 Response Rate

Of the 379 surveys distributed, 311 were returned, from which 6 surveys were disqualified as incomplete filled items. The overall response rate was 80.5%.

**Table (5.1): Percentage of valid replies**

| Hospital | Staff | Overall Participants | | |
|---|---|---|---|---|
| | | Distribution | Collection | **Response Rate** |
| Rafedia Hospital – Nablus Governorate | Physicians | 133 | 94 | **77.4%** |
| | Nurses | 197 | 166 | **84%** |
| | Paramedical | 45 | 45 | **100%** |
| Darweesh Nazzal Hospital-Qlaqelia Governorate | Physicians | 25 | 22 | **88%** |
| | Nurses | 60 | 60 | **100%** |
| | Paramedical | 14 | 14 | **100%** |
| Total | | 379 | 305 | **80.5%** |

## 5.2 Characteristics of the respondents

(72.1%) of the participants were from Rafedia staff, and the remaining respondents were from Darweesh Nazzal (27.9 %). Almost half of the respondents were males (55.0%) compared to females (45.0 %). The majority of respondents were between the ages of 25-35 (63.0 %).As for education; (74.2%) have a bachelor's degree and (16.4%) have a post-graduate degree.

About half of the respondent's experience (48.5%) is located in the 1-5 years group, while (41.3%) were in the more than 6 years group. While the majority of respondents (54.4%) (166) were nurses, (30.5%) (93) and (15.1%) were paramedical staff (laboratory technicians, radiology technicians and pharmacists). More than two thirds of the respondents 78% (238) have a previous experience in using computers. More than half of the respondents 53.8% (164) have more than 11 months in using the CHMIS in the same hospital, 21.0% (64) of them have 4-7 months, 14.4% (44) of them have experience from 8-10 months, and the remaining were located in the less than 3 months group. While the majority of the respondents 73.4% (224) had no experience in using CHMIS, only 26.6% (81) had prior-experience in using the system.

**Table (5.2): Characteristics of the respondents**

| Hospital Name | Frequency | % |
|---|---|---|
| Rafedia - Nablus | 220 | 72.1 |
| Darweesh Nazzal-Qalqelia | 85 | 27.9 |
| Total | 305 | 100.0 |
| **Gender** | | |
| Male | 168 | 55.0 |
| Female | 137 | 45.0 |
| Total | 305 | 100.0 |
| **Age (years)** | | |
| 20-35 | 192 | 63.0 |
| 36-50 | 105 | 34.4 |
| More than 50 | 8 | 2.6 |
| Total | 305 | 100.0 |
| **Education** | | |
| Diploma | 111 | 36.4 |
| Bachelors | 144 | 47.2 |
| Post-Graduate | 50 | 16.4 |
| Total | 305 | 100.0 |
| **Years of experience in current hospital** | | |

| | | |
|---|---|---|
| Less than 1 | 31 | 10.2 |
| From 1-5 | 148 | 48.5 |
| > 6 | 126 | 41.3 |
| Total | 305 | 100.0 |
| **Current Position** | | |
| Physicians | 93 | 30.5 |
| Nurses | 166 | 54.4 |
| Laboratory  technicians | 21 | 6.9 |
| Radiology Technicians | 13 | 4.3 |
| Pharmacist/  Pharmacist assistants | 12 | 3.9 |
| Total | 305 | 100.0 |
| **Supervisory  Job** | | |
| Yes | 55 | 18.0 |
| No | 250 | 82.0 |
| **Experience working with computers** | | |
| Yes | 238 | 78.0 |
| No | 67 | 22.0 |
| Total | 305 | 100.0 |
| **Experience  working  with  CHMIS  at current hospital (months)** | | |
| > 3 | 33 | 10.8 |
| 4-7 | 64 | 21.0 |
| 8-10 | 44 | 14.4 |
| > 11 | 164 | 53.8 |
| Total | 305 | 100.0 |
| **Previous  experience in using CHMIS** | | |
| Yes | 81 | 26.6 |
| No | 224 | 73.4 |
| Total | 305 | 100.0 |

**Table (5.3): Characteristics of workplace**

| Extent of use | Frequency | % |
|---|---|---|
| Always | 283 | 92.8 |
| Rare | 16 | 5.2 |
| Very Rare | 6 | 2.0 |
| Total | 305 | 100.0 |
| Number of PCs at department | Frequency | % |
| 1-2 | 88 | 28.9 |
| 3-4 | 108 | 35.4 |
| 5-7 | 36 | 11.8 |
| > 7 | 73 | 23.9 |
| Total | 305 | 100 |

Of the total participants 92.8 % (283) use the system to perform their daily tasks and activities. This shows a high extent use of the system, only 7.2% (22) of them don't depend on system to perform their daily tasks and activities. For those users who are answering by Rare and Very Rare (7.2) the result of cross tabulation result shows that the availability of Computers at the hospital departments has not affecting the extent of use.   As for the availability    of Personal computers (PCs, portable PCs, and laptops), 64 % (196)  of the users have between 1 - 4 computers in their departments, 23.9% (73)   have less than 7 computers in their department, and 11.8% (36)  have 5-7 computers in their departments.

## 5.3 Ease of Use of the CHMIS

The respondents were asked to score the five statements about the use of the CHMIS in comparison with the paper based system. In general, this domain received a positive score of 76.0% denoting easy use of the CHMIS (Table 5.3). The highest positive score (82.0%) was for "frequent use of the CHMIS contributed to reducing false entries" and 81.0% indicated that the system is easier than the paper-based in documentation and communication. In addition, 78.0% of participants indicated that they can use the CHMI Regardless of their years of experience and education level. While 72.0% considered the (CHMIS) pop up warning messages reduced incorrect transactions, 66% of the respondents considered correcting wrong

data input (misspellings, data entry, orders) can be easily done through the computerized system, which shows possibility for improving the CHMIS in that regard.

**Table (5.4): Users' perceptions toward the ease of use of CHMIS**

| Domain 1: Ease of Use (Cronbach's α=0.74) | Mean score | SD | % Positive responses |
|---|---|---|---|
| 1. Frequent use of CHMIS contributes in reducing false entries. | 75.0 | 0.82 | 82.0 |
| 2. CHMIS is easier than paper-based system in terms of documentation and communication. | 76.0 | 0.98 | 81.0 |
| 3. I can use the CHMIS easily regardless of my years of experience and education level. | 71.0 | 1.09 | 78.0 |
| 4. CHMIS pop up warning messages reduce wrong transactions. | 70.0 | 0.88 | 72.0 |
| 5. Correcting wrong data, such as, (misspellings, data entry, and orders) can be done easily through the CHMIS. | 65.0 | 1.04 | 66.0 |
| Average | 71.0 | 1.0 | 76.0 |

## 5.4 Effectiveness of the CHMIS

The domain effectiveness studies the users' perceptions towards the effectiveness of the newly implemented CHMIS in the MoH hospitals (Table 5.4). The implemented system is expected to have an impact on the patient safety through preventing medical errors that are related to misidentification of patients, medication errors, as well as other diagnosis and treatment errors. The effectiveness domain received a total of 73.0% of positive responses, denoting that the system in general has moderate positive impact on the effectiveness of care (safety of care, and accuracy of documentation). In addition the majority of the respondents (88%) agreed that the CHMIS helps to determine the patient identity in terms of a full name and an identification card which helps reduce the errors in ordering lab tests, medications, and therapeutic

procedures, (83%) agreed CHMIS reduces malpractice resulting from the lack of clarity due to poor handwriting, and 79% indicated that the CHMIS improves accuracy compared to the manual approach (hand writing), (71.0%) of them agreed that the system reduces the occurrence of errors in drug ordering by showing drug interactions and contradictions, 64% of the respondents agreed that the system contributes to promoting patient safety culture or improves data safety and medical information by protecting data from being lost. However, only 55% agreed that the system contributes in reducing malpractice by empowering accurate diagnoses by using international classification of diseases (ICD 10), which improves and increases safety of given diagnoses and treatment and finally (55.0%) of them agreed that the system contributes in reducing malpractice in terms of diagnoses and treatment.

**Table (5.5): Users' perspectives toward the Effectiveness of the CHMIS**

| **Effectiveness** (Cronbach's α=0.84) | Mean score | SD | % Positive responses |
|---|---|---|---|
| 1. Helps in determining patient's identity in terms of: Full Name and ID card no which helps reduce errors in ordering lab tests, medications and therapeutic procedures. | 79.0 | 0.89 | 88.0 |
| 2. Reduces malpractice resulting from poor handwriting. | 73.0 | 1.03 | 83.0 |
| 3. Improves accuracy compared with hand- writing. | 69.0 | 1.04 | 79.0 |
| 4. Reduces the occurrence of errors in drug ordering by showing drug interactions and contradictions. | 71.0 | 0.89 | 71.0 |
| 5. Contributes in promoting patient safety culture. | 65.0 | 0.92 | 64.0 |
| 8. Improves data safety and medical information. by protecting data from being lost. | 72.0 | 0.83 | 64.0 |
| 6. Empowers accurate diagnoses by using international classification of diseases (ICD 10) which improves and increases safety of given diagnoses and treatments. | 62.0 | 1.08 | 55.0 |
| 7. Contributes in reducing malpractice in terms of diagnoses and treatments. | 60.0 | 1.02 | 55.0 |
| Average | 69.0 | 0.96 | 73.0 |

## 5.5 Impact of using Computer Ordering Physician Entry (COPE)

The (COPE) domain received 58.3% of positive responses, denoting low agreement with the effect of the (COPE) system on the rationality use of resources, i.e. eliminating number of drugs dispensed, radiology exams, and laboratory tests (Table 5.5). Although the system is expected to make an impact on rationalizing the process of ordering exams in terms of quantity and quality, providing timely treatment, and, enhancing the quality of services provided, the results indicated low perceptions. The majority of the respondents (83%) agreed that the CHMIS increases communication efficiency between the ordering departments (doctors and departments) and the ordered departments (laboratory and radiology technicians). By contrast, only 35% of the respondents agreed that the system decreased unnecessary orders, and 43% of them agreed that the system contribute to achieving rationality and governance. Similar percentage of agreement were observed with the following statements, system increased patient safety by monitoring the process of drug dispensing (56%), and the system increased patient satisfaction(57%). Finally, 65% of the respondents think that the system decreased the time of processing the orders (laboratory, radiology and drugs) and 69% of them agreed that the system led to an increase in accuracy.

**Table (5.6): Impact of Computer Ordering Physician System**

| Computer Physician Order Entry (COPE) (Cronbach's α=0.88) | Mean score | SD | % Positive responses |
|---|---|---|---|
| 1. Increase in communication efficiency between ordering and ordered departments. | 71.0 | 0.69 | 83.0 |
| 2. Increase in the accuracy of ordered exams, tests , and medication. | 65.0 | 1.06 | 69.0 |
| 3. Decrease in the time of processing the orders (lab, radiology, and drugs). | 62.0 | 0.95 | 65.0 |
| 4. Increase patient safety by monitoring the process of drug dispensing. | 65.0 | 0.96 | 56.0 |
| 5. Contribute in achieving rationality and governance. | 49.0 | 1.28 | 43.0 |
| 6. Decrease in unnecessary orders. | 47.0 | 1.21 | 35.0 |
| 7. Increase patient satisfaction. | 57.0 | 1.05 | 57.0 |
| Average | 59.0 | 1.03 | 58.3 |

## 5.6 Efficiency of the CHMIS

The efficiency of CHMIS domain received an overall of (75%) positive responses indicating high positive impact of the system on the services (Table 5.6). In specific, (87%) of the respondents indicated that the system prevented data and patient documents from being lost; an equal percentage (82%) agreed that it contributes to accessing medical registry very easily. In addition, (78%) of respondents indicated that the system facilitates the process of communication and coordination between different departments, and (76%) agreed that the system facilitates the process of communication and arrangements between different staff members. Only 64% agreed that the system reduces the time spent in diagnoses and documentation and a similar percentage agreed that it contributes to the process of filling out forms and meeting the necessary information from patients easily.

**Table (5.7): Users' perceptions toward the impact of the CHMIS on efficiency**

| Efficiency of the Computerized HMIS(Cronbach's α=0.83) | Mean score | SD | % Positive responses |
|---|---|---|---|
| 1. Prevents data and patient documents from being lost. | 81.0 | 0.76 | 87.0 |
| 2. Contributes to accessing medical registry very easily. | 78.0 | 0.76 | 82.0 |
| 3. Facilitates the process of communication and arrangements between different departments (medical, medical support and administrative, etc.). | 75.0 | 0.86 | 78.0 |
| 4. Facilitates the process of communication and arrangements between different staff members (medical, medical support and administrative, etc.). | 71.0 | 0.80 | 76.0 |
| 5. Reduces time spent in diagnoses and documentation. | 63.0 | 1.1 | 64.0 |
| 6. Contributes in the process of filling out forms and meets the necessary information from patients easily. | 70.0 | 1.06 | 64.0 |
| Average | 73.0 | 0.89 | 75.0 |

## 5.7 Challenges of the implementing CHMIS

This part shows the agreement of the respondents on statements representing the challenges for using the CHMIS in the studied hospitals (Table 5.7). In specific, (74.0%) of the respondents agreed that the limited number of distributed computers in the hospital's departments is the main challenge, (68.6%) of them agreed that the working hours are insufficient to work overload. (64.4%) reported lack of logistical support (e.g. ink, papers, regular maintenance), (49.8%) agreed that lack of financial support denoting this as a moderate challenge, (47.0%) indicated the lack of staff training (on-site training, functional training, and field support), and (44.0%) consider lack of knowledge and skills in using the CHMIS as other challenges. The capacity of management and staff are also among other challenges, where (43.6%) indicated that the lack of supervision and management follow ups of logistical support (i.e. ink, printer paper, stationary, etc.). In addition, (40.3%) agreed that

the lack of knowledge in the importance of CHMIS, and finally (28.0%) agreed that trusting in system's capability is considered as one of the low challenges. The results showed three types of challenges to exist: financial, technical, and management support.

**Table (5.8): Users' perceptions toward the challenges for the implementation of the CHMIS**

| Main Challenges (Cronbach's α=0.83) | Mean score | SD | % Positive responses |
|---|---|---|---|
| 1. Limited number of distributed computers in hospital's departments, | 81.0 | 0.71 | 74.0 |
| 2. Insufficient working hours due to work overload. | 61.0 | 0.96 | 68.6 |
| 3. Lack of logistical support (e.g. ink, papers, regular maintenance). | 71.0 | 1.01 | 64.40 |
| 4. Lack of financial support. | 56.0 | 1.12 | 49.8 |
| 5. Lack of staff training (on-site training, functional training, and field support) | 55.0 | 0.96 | 47.0 |
| 6. Lack of knowledge and skills in using CHMIS. | 72.0 | 1.02 | 44.6 |
| 7. Lack of supervision and management follow up. | 58.0 | 1.08 | 43.6 |
| 8. Lack of knowledge with importance of CHMIS. | 50.0 | 0.94 | 40.30 |
| 9. Lack of trust with system capability. | 57.0 | 0.97 | 28.0 |

## 5.8 Extent of Use of CHMIS's reports on the decision making

This domain received an overall of 70.0% positive response, indicating a high positive perception towards the reports provided by the CHMIS (Table 5.8). The implemented system expects to enhance the decision making process by providing accurate data in real time, that's valid and reliable. The majority (81%) of respondents agreed that the system helps in tracking the management costs and monitoring of health services provided to patients and clients. Similarly, 81% of them agreed that the system helps in enhancing the quality of the decision making process, (76%) of them agreed that the system helps in providing timely and accurate data for decision. Furthermore, (76%) of respondents indicated that the system helps in the process of organizing and distributing human resources in terms of tasks, roles and responsibilities, (69.0%) indicated that the system helps in increasing the efficiency of

workers in terms of executing their tasks accurately with minimum effort, (67.0%) agree that the system helps in developing employees analytical and technical skills by using the reports and information generated by the system, (67.0%) of them agree that the system minimizes efforts, and saves time in gathering data for making alternative decisions, (64.0%) agreed that the system helps in reducing employee's efforts in performing everyday duties and employed it in creative work, similarly they agreed on the following items: the system's reports helps in issuing administrative reports, transforming data for decision making purposes, and finally providing all data needed for decision making.

**Table (5.9): Users' perceptions toward the extent use of CHMIS's reports on the decision making**

| Using system reports in decision making (Cronbach's α=0.89) | Mean score | SD | % Positive responses |
|---|---|---|---|
| CHMIS reports helps in cost management and monitoring. | 69.0 | 0.76 | 81.0 |
| CHMIS reports enhances the decision making process. | 67.0 | 0.80 | 81.0 |
| A CHMIS report provides timely and accurate data for decisions. | 73.0 | 0.77 | 76.0 |
| CHMIS reports helps in the process of organizing and distributing tasks (roles and responsibilities). | 65.0 | 0.75 | 76.0 |
| CHMIS reports increases the efficiency of workers. | 68.0 | 0.91 | 69.0 |
| CHMIS reports helps in developing employees' analytical and technical skills through the reports and information generated by the system. | 70.0 | 0.96 | 67.0 |
| CHMIS reports minimize efforts in gathering data for making alternative decision. | 72.0 | 0.74 | 67.0 |
| CHMIS reports reduces employee's efforts in performing every day duties and employed it in a creative work. | 67.0 | 1.04 | 64.0 |
| CHMIS reports helps in issuing administrative reports. | 73.0 | 0.93 | 64.0 |
| CHMIS reports transforms data for decision making purposes. | 72.0 | 0.78 | 64.0 |
| CHMIS reports provide all data needed for decision making. | 69.0 | 0.77 | 64.0 |
| Average | 70.0 | 0.84 | 70.0% |

## 5.9 Study domains by hospital and participants characteristics:

The highest mean score is for Rafedia hospital (68.5%), in comparison with Darweesh Nazzal hospital (68.1%). T-test was used to examine the relationship between the study domains and hospitals. No significant differences between any of the study domains in relation to the studied hospitals (P>0.05) (Table.4.9). T-test was used to examine the relationship between the study domains and gender of participants (Table 4.9). Strong relationship between gender and four of the study domains were found. Whereas, females scored significantly higher than males for the ease of use (P<0.001), effectiveness (P=0.007) and finally efficiency (P=0.074) is not significant for reports using. One-way ANOVA test was used to examine the relationship between study domains and participant age groups (Table.4.9). The results show that there is a significant association between the participants age groups and the ease of use (P=0.001), effectiveness (P=0.05). The 36-50 years age group scored these domains a little bit higher than the other two groups. One-way ANOVA test was used to examine the relationship between study's domain and variables. The education level has no association with the users' perceptions toward any of the study domains. One-way ANOVA test was used to examine the relationship between the study domains and variables. There are no significant differences between the study domain and independent variables are at ($\alpha < 0.05$). Thus, the experience at the same hospital level has no effect on the users' perceptions toward the study domain. The scores generally reflected poor perceptions, where the highest score were >1 year group (72.8% average mean of all domains) and the lowest were 1-5 years group (67.0% average mean of all domains). One-way ANOVA test was used to examine the relationship between the study domains and variables.

Moderate relationships are found between profession (physician, nurse, laboratory technicians, radiology technicians, and pharmacists) and the study domain at ($\alpha < 0.05$), where there are significant differences between the following study domains: ease of use (P=0.001), effectiveness (P=P 0. <001), and finally reports using (P=0.042). The score mean generally is low, the highest score is for radiology technician (75.0% average mean of all domains), and the lowest one is for laboratory technicians (56.0% average mean of all domains).One-way ANOVA test was used to examine the relationship between the study domain and variables. The experience of using CHMIS inside the hospital has no effect on the users perceptions

toward the study domain as in table (5.9) but there are differences in the mean score, where the users who used the system from 8-10 months scored the highest points (71.6%), and the lowest scores were by the group who used the system for less than 3 months (69.9%). A Strong relationship is found between previous experience of using HMIS outside the hospitals and the study domain at (α < 0.05), where there are significant differences between the following study's domains: ease of use (P=0.001), effectiveness (P=0.001), (COPE) (P=0.001), and finally efficiency (P=P 0.<001).The score mean is generally  low, where highest score is (70.0% averages mean of all domains) was for those who used the system before and the lowest for those who hadn't used it before.

**Table (6.0): Users' perceptions mean domains scores by hospitals and participant characteristics**

|  | Ease Use | | Effectiveness | | COPE | | Efficiency | | Report Using | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Hospital** | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Rafedia | 71.5 | 0.65 | 71.5 | 0.69 | 60.0 | 0.63 | 72.5 | 0.59 | 67.0 | 0.79 |
| Qalqelia | 70.5 | 0.73 | 71.5 | 0.69 | 57.0 | 0.70 | 73.5 | 0.64 | 68.0 | 0.50 |
|  | F=400 | P=0.69 | F=-0.59 | P=0.55 | F=0.52 | P=0.60 | F=-0.59 | P=0.55 | F=-0.13 | P=0.8 |
| **Gender** | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Male | 69.0 | 0.67 | 68.0 | 0.67 | 53.5 | 0.68 | 71.0 | 0.65 | 67.0 | 0.62 |
| Female | 75.5 | 0.65 | 68.3 | 0.67 | 71.0 | 0.57 | 75.0 | 0.56 | 70.0 | 0.43 |
|  | F=-3.3 | P=0.001 | F=-2.69 | P=0.007 | F=-.83 | P=0.074 | F=-1.99 | P=.047 | F=-.60 | P=0.54 |
| **Age** | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 21-35 Yrs. | 71.3 | 0.66 | 70.5 | 0.61 | 60.0 | 0.69 | 73.0 | 0.60 | 67.0 | 0.60 |
| 36-50 Yrs. | 73.0 | 0.59 | 72.0 | 0.57 | 59.0 | 0.63 | 73.0 | 0.55 | 68.0 | 0.77 |
| > 50 Yrs. | 49.0 | 1.20 | 58.0 | 1.14 | 59.0 | 0.65 | 59.0 | 1.14 | 73.0 | 0.24 |
|  | F=7.93 | P<0.001 | F=2.97 | P=0.05 | F=.008 | P=0.93 | F=3.27 | P=0.04 | F=0.14 | P=0.87 |
| **Education** | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Diploma | 74.0 | 0.61 | 73.0 | 0.57 | 62.0 | 0.66 | 74.0 | 0.56 | 74.0 | 0.97 |
| Bachelor | 70.0 | 0.69 | 69.0 | 0.64 | 57.0 | 0.65 | 73.0 | 0.60 | 68.0 | 0.58 |
| Post-Graduate | 69.0 | 0.73 | 70.0 | 0.65 | 77.0 | 0.64 | 71.0 | 0.71 | 72.0 | 0.40 |
|  | F=1.86 | P=0.157 | F=1.93 | P=0.15 | F=1.05 | P=0.37 | F=1.06 | P=0.35 | F=0.73 | P=0.49 |
| **Experience** | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| >I Yr. | 72.0 | 0.63 | 70.0 | 0.59 | 72.0 |  | 73.0 | 0.49 | 77.0 | 0.10 |
| 1-5 Yrs. | 71.0 | 0.68 | 70.0 | 0.64 | 58.0 | 0.62 | 72.0 | 0.65 | 64.0 | 0.74 |
| >6 Yrs. | 71.0 | 0.68 | 71.0 | 0.60 | 59.0 | 0.68 | 74.0 | 0.57 | 68.0 | 0.69 |
|  | F=0.02 | P=0.98 | F=0.21 | P=0.80 | F=0.30 | P=0.74 | F=0.77 | P=0.46 | F=0.64 | P=0.53 |
| **Profession** | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Doctor | 72.5 | 0.75 | 65.0 | 0.66 | NA | NA | 68.3 | 0.64 | 66.0 | 0.55 |
| Nurses | 74.3 | 0.61 | 74.0 | 0.56 | NA | NA | 75.3 | 0.58 | 70.0 | 0.78 |
| Lab. Tech | 70 | 0.46 | NA | NA | 55.0 | 0.60 | 71.0 | 0.40 | 56.0 | 0.56 |

| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
|---|---|---|---|---|---|---|---|---|---|---|
| Rad. Tech | 74 | 0.71 | NA | NA | 57.0 | 0.72 | 76.5 | 0.80 | 76.0 | 0.70 |
| Pharmacist | 77.5 | 0.53 | NA | NA | 64.0 | 0.57 | 72.0 | 0.46 | 75.0 | 0.74 |
| | F=5.65 | P<0.001 | F=5.86 | P=`0.49 | F=3.36 | P=0.003 | F=-3.51 | P=0.001 | F=-.56 | P=0.003 |
| **Previous Experience in CHMIS** | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| > 3 Months | 70 | 0.71 | 71.5 | 0.65 | 69.0 | 0.52 | 70.0 | 0.60 | 69.3 | 0.32 |
| 4-7 Months | 69.5 | 0.56 | 68.8 | 0.59 | 57.0 | 0.59 | 72.0 | 0.56 | 68.0 | 0.68 |
| 8-10 Months | 73.5 | 0.63 | 73.5 | 0.52 | 59.5 | 0.94 | 75.0 | 0.60 | 73.8 | 0.61 |
| > 11 Months | 71.5 | 0.71 | 71.0 | 0.65 | 58.3 | 0.62 | 73.0 | 0.63 | 67.0 | 0.72 |
| | F=0.60 | P=0.61 | F=0.74 | P=0.53 | F=0.48 | P=0.70 | F=0.76 | P=0.52 | F=0.21 | P=0.89 |
| **Ever use the CHMISbefore** | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Yes | 67.5 | 0.76 | 70.3 | 0.61 | 71.0 | 0.74 | 72.3 | 67.0 | 69.0 | 0.66 |
| No | 71.8 | 0.64 | 58.3 | 0.63 | 74.3 | 0.48 | 73.0 | 72.0 | 69.8 | 0.71 |
| | F=99.7 | P<0.001 | F=98.1 | P<0.001 | F=0.37 | P<0.001 | F=112 | P <P 0.<001 | F=95 | P=0.001 |

# Chapter Six

## Discussion and Recommendations

## 6.1 Introduction

This chapter discusses the results of the survey on assessment of users' perspectives toward the implemented CHMIS in governmental hospitals in Palestine - West Bank. The first section discusses the profile of respondent's characteristics and presents the significant differences between the study domains and the independent variables. The second section discusses the results of the study domains; in particular the perception of the participants towards the effectiveness, efficiency, COPE impact, and using the system's reports in decision making. Finally, the chapter concludes the implications and recommendations of the study.

## 6.2 Characteristics of Participants

The results showed that the majority of healthcare professionals completely depend on the CHMIS. This dependency rate represents a good indicator to measure the trust with system capability and continuity. This result is consistent with Abeer's study that was conducted in Abdul-Aziz Medical City Saudi Arabia (Abeer, 2011) and Hayajneh's study that was conducted in Jordan at Prince Hamza Teaching Hospital (Hayajneh, 2006). The results revealed that there were no significant differences between the selected hospitals in any of the study domains (P<0.05). In fact, these results were expected since the implementation period for the two hospitals were close and both hospitals are public hospitals owned by the government and worked under the same conditions, polices, and procedures.

As for gender; females were more positive than males and showed significant differences toward the ease of use, effectiveness, (COPE), and efficiency perceptions (P<0.001, P<0.007, P<0.047 and P<0.047respectively). This explains the positive impact of CHMIS on accelerating delivery of services and efficient communication, since females represent high percentage of health workers where they worked with frontline patient care. In addition they

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performed a lot of non-care services like documentation and coordination. Obviously most of the females' tasks and activities required easy and high speed communication, which would explain their positivity toward the ease of use and efficiency items.

We observed that they cooperated more than males during the implementation period. This is consistent with Abeer's Study that showed significant differences in the respondent's perceptions (physicians and nurses) on the items related to time saving, efficient communication, and improving the quality of patient's care (Abeer, 2011). Harris's study also indicated that positivity of females toward the CHMIS was more than that of males (Harris N. at al, 2009). One recent study conducted in four Telecommunication companies showed (Al-adaileh, 2009) that women have positive perceptions toward developing their computer skills in comparison to men where they show that females are more positive toward the IT skills even if they have lower tendency toward IT professions. We think that in our society females are always trying to improve their abilities by showing more commitment and loyalty to work, since they represent only 8.8% of the workforce in the health sector (PCBS, 2012).There were significant differences in the perceptions of participant in respect to the 36-50 age group and ease of use, effectiveness, and efficiency items (P<0.001, P<0.005, P< 0.004) respectively. Specifically, the results were indicated to high associations between ease of use and efficiency domains according to this age group. Obviously, the results indicate the tangible impact related to time saving, communication, easiness and usefulness of system. It's worth mention that, this age group has been involved in the management and leadership position in the implementation period. Their participation was extended to formulation the follow-up committees, focal points, and coordinators roles.

In such a study, this age group has significant relations on the positivity of perceptions toward the IT and computers. Al-daileh's study 2009 that was conducted to evaluate the success factors behind using the information systems in Jordanian Telecommunication Companies from the users' perspectives indicated the importance of easiness, usefulness and efficiency of the system to ensure successful implementation (Al-daileh, 2009). Abeer's study 2011 also indicated to the positivity of 36 age group toward the study items (Abeer, 2011). As for the education level, the analysis revealed that there are no significant differences between

education and the study domain. Musbah's study shows similar results for the users' perspectives toward the domains of their study (Musbah, 2010). The results of the education variable contradict the expectations of the researcher and stakeholders. The results are inconsistent with the traditional view which says that as the education level increases the positivity toward the IT application will increase. Therefore, we think that the perceptions formulated from practices and using instead of previous knowledge.

Our study proves that the non-experienced participants in using CHMIS show positive scores than those having previous experience in using CHMIS. As for profession, the study targeted two types of participants; medical staff (nurses and physicians) and paramedical staff (pharmacists, radiology technicians, and laboratory technicians). The results showed significant differences in the perceptions of the nurses toward the ease of use from the medical group (P <0.00). The results are similar to Abeer's study, which revealed that the nurses' perceived positive perceptions toward the speed of tasks accomplished, ease in finding investigation results, decreasing workload, preparing hospital reports and improve decision making process (Abeer, 2011). Whereas, our results contradict Hayajneh's study 2006 , where the physicians showed positive perceptions more than nurses, and Keith's study that indicated also for positivity of medical staff (Physician) toward using the health information technology in their career; furthermore the study shows an association and link between HIT and Physician career satisfaction, and higher-quality medical care (Elder. et al., 2010). According to the paramedical staff, they showed mixed perceptions, where the pharmacists staff show significant association with COPE impact (P <0.003), while the perceptions of radiology technicians (P<0.001) showed an association between efficiency and extent of use of reports in decision making. These results meet the expectations of the researcher and the stakeholders for the potential benefits gained from the CHMIS, where the affected staffs are the most overwhelmed and stressed staff. The pharmacists have more positive score toward the impact of implemented COPE than radiology technicians.

The perceptions of pharmacists may be explained by the benefits gained from the system such as rational using of resources, time saving, and reducing potential ordering drugs, as a result of clarity of electronic order, and availability of full patient identification information. Although

there is no evidence about decrease in medication error and rationality of dispensing drugs, but the notable changes are observed from the users' perspectives either medical or paramedical staff. There were no significant differences in the perception of participants between experience inside the hospital and the study domain, which is consistent with Musbah, and Abeer's studies (Hayajneh, 2006) (Abeer, 2011). Consequently, the users' perceptions would be formulated from frequent uses and practices rather than years of experience, since some users were fresh graduates or new employees who provided high positive perceptions toward the system, in contrast to the high experienced users who provided negative perceptions due to the burn-out effect and vice versa. Significant differences were found in relation to previous experience with HIT, where the results show that the experienced participants were more positive toward the effectiveness domain (P<0.01). Whereas; non-experienced users showed more positivity toward the rest of the study domains ease of use, (COPE), efficiency, and report using (P=0.01), (P=0.01), (P=0.00), (P=0.01) respectively. In fact, the result may be explained by the assumption that states: that perception formulated from the practice rather than previous experience.

We observed this during the implementation where those who used such systems when being skeptical and insisting on always comparing the implemented system with the previously used systems. Another explanation for the negativity of experienced users is frequent complains about the system features, and functionality, i.e. why the system was not performing like what we have used in other countries.

## 6.3 Ease of Use impact (Usefulness)

Easiness, usefulness, usability, enjoyment, technology acceptance, playfulness, self-efficacy are related terms used to measure easiness of computerized information systems (Venkatesh, 1998). The potential benefits from the implemented system are facilitating the daily business transactions and activities as easier, overcoming the complexity and time consumption related to the activities of patients and workers. Obviously, the results indicate that the system is easy and user friendly. The results show significant differences in the respondent's perceptions toward the ease of use domain in respect to females, young participants (35-50 age group) and participants who have previous experience in HIT.

The results are consistent with Al-Shurafa's study 2004 which revealed that 73.0% of participants show positive perceptions toward the ease of use of computerized system in European Gaza Hospital (Al-Shurafa, 2004).

However, the results contradict with Hayajneh's study 2006 which was conducted at Hamza Prince Teaching Hospital, where 72.0% of the participants reported that the system is not easy to use for performing daily activities. Generally, ease of use classified as Human Computer Interaction (HCI) is a discipline that studies the satisfaction of electronic systems' perceptions. Furthermore, it's considered as an essential factor to measure the success or failure of the implemented electronic information system (Eldon, 1997). The positivity toward ease of use domain may be explained by high commitment and management follow-up for the daily implementation progress. Consequently, our results indicated high agreement of participants on the management positive role for success of the project (56%).

Similarly, a study conducted in USA (Mary et al., 2009) revealed that a strong relationship found between management supports and perceived positive attitude toward the easiness and usefulness of electronic information system. Furthermore, the analysis revealed that users themselves perceived the benefits of the system in terms of enhancing creativity, time saving, high quality of performed tasks, in comparison with the past bureaucratic style (Mary et al., 2009). In addition, they described the old system as a reactive system in contrast to new system that depended on creativity and proactivity (Mary et al., 2009).

Another explanation for the positivity of users' perceptions is the system impact on procedural enhancements and improvement which became easier than the past manual system. Specifically, the hospital management starts feeling that the implementation of any new protocols or producers becomes easier as a result of using the new system. .Obviously the results provide both a positive motive and indicator for upcoming projects to be implemented in the governmental environment. Moreover it's a good indicator to see positive perceptions from the environment which is characterized by bureaucracy, highly resistance to change, and rigidity.

## 6.4 Effectiveness impact (Patient Safety)

The Institute of Medicine (IOM) in its famous report "To err is Human" (IOM, 1999) recommended the health institutions to devote heavy resources to adopt new technology in managing, ordering, identifying and retrieving health information. IOM recommended information technology as a major mechanism to reduce errors (Staggers N et al., 2009). Health information technology aims to improve health care quality, prevent medical errors, reduce health care costs, increase administrative efficiencies, decrease paperwork, and expand access to affordable care (Wikipedia, 2013). The overall perceptions toward impact of the implemented CHMIS on the safety of care provided and accuracy of performing tasks are high (72.0%). The results are consistent with IOM report 2012 which indicated to importance of HIT applications in improving patient care and safety (IOM, 2012). Similarly, the results of stagger's study which shows positive impact of such system on the patient safety issue (Staggers N et al., 2009). In addition to Musbah's Study 2010 showed same results. Our results are consistent with the core function for the HIT applications which can be summarized in allowing the medical team to coordinate care in the most effective and affordable way, in addition to improving the quality of care provided for the patient with minimum level of malpractice (Markle Foundation, 2009). Significant differences were found according to the gender; male and females are perceived the same toward the effectiveness domain in t contrast to other domains score, age group 36-50 years, and previous experience in using HMIS (P <0.007, 0.005, and 0.001) respectively.

We believe that, using advanced HIT in treatment, diagnosis, communication, sterilization, and finally in maintaining the medical records from loss. Accordingly the decision making and judgment of patient's health status relies on the quality of medical record contents. The effectiveness domain is the core of the study, since measuring the safety is not easy, and needs multidisciplinary efforts. However our study assessed the perceptions of users toward the impact of the CHMIS on patient safety; minimizing the medical error and performing tasks well with minimum efforts. The results showed high positivity toward the impact of the system on increasing accuracy and minimizing patient identification errors and reducing the errors that could happen in ordering lab tests, medications and therapeutic procedures. It

would be worth mentioning that most of the medical errors started from wrong patient identification, or dose of drugs, or administration of the drugs.

Due to the lack of structured and effective adverse events reporting system in public hospitals, it's difficult to measure the direct impact of HIT application either positively or negatively on the patient safety issue. But, the positive perception for minimizing errors those selecting the right patient and high accuracy of typed characters in comparison with hand writing are essential factors in ensuring robust readable and reliable medical record.

## 6.5 Computerized Order physician Entry (COPE) Impact

The implemented COPE has potential to reduce potential human errors, reducing time to care delivery, improving communication among medical staff (Staggers N et al., 2009)
Accordingly, the health institutions are motivated to implement such system to gain efficient and effectiveness which lead to more governance and transparency inside the organization (IOM, 1999).
Generally this domain signifies two mixed perceptions for both efficient and effectiveness items. The efficiency items are divided into two parts; the first part represents the time saving, and communication, where the other part represents resources saving (e.g. rationality of ordering lab test, radiology exams, and drugs). While communication and time saving items high positive score, the other efficiency items related to resources saving high negative perceptions toward the impact of COPE in achieving rationality and governance inside the hospitals. Effectiveness survey items are divided also into two parts, the first part represent patients safety like minimizing medical errors by using COPE, the first part represent accuracy of performed tasks. Therefore the overall perceptions toward the effectiveness of implemented COPE were slightly positive on both mentioned parts. This is consistent with Karen's study that assesses the effect using of COPE on the drug orders, which revealed that the COPE may reduce errors and the harm effect (Staggers N et al., 2009).

Cordero's study is consistent to our results related to accuracy of ordered tests and drugs (Staggers N et al., 2009) Kuperman' study revealed that the COPE reduces the length of stay (Staggers N et al., 2009) Thompson shows that the (COPE) improved test turnaround time for stat lab and radiology orders (Thompson, 2004). In contrast, our study revealed negative

perceptions toward the safety of care provided as a result of using COPE. Bate's study revealed that (COPE) takes more time (Bates, 1994), Hayajneh's study showed that 45.0% of respondents reported that the system improved the access to radiology results (Hayajneh, 2006) As for effectiveness there are many studies consistent with our study, i.e. Bates (1998). Other studies contradict our results of reducing medical errors and increasing patient safety level, Bates (1998) (Staggers N et al., 2009).

The explanation of negative perception toward the rationality and saving resources may refer to existing functional features in the implemented system like ready-made set of orders (laboratory, radiology, and drugs) which enable the physician to select multiple orders in a few seconds. Obviously physicians consider the ordering process as easy and fast, in contrast to the paramedical staff who complained about –unnecessary orders – and unreasonable amount of orders received from the physicians. The significant relationship found between impact of using (COPE) in daily tasks and pharmacists and the participants with no previous experiences in HIT (P<0.003, and 0.00.1) respectively. The most notable impact of the system was the sharp decrease in drug orders, which explains the significant difference in response to (COPE) impact on the utilized resources from pharmacists. Regarding inexperienced users, the significant difference may be explained by perceptions not being formulated from previous judgment but from real using and daily practices.

## 6.6 Efficiency impact (Time saving and Communication)

Time saving, speed of communication, efficient communication, and high accuracy of delivered data are related measurements used to assess the efficiency of the information system. The findings show high acceptance for the implemented system in terms of its impact on time saving, speed of retrieving and accessing data. The domain denoted positive perceptions (75.0%) toward the efficiency statements. Our results are consistent with Andrew's result which shows HIT applications enhance time efficiency; clinicians can communicate more effectively, and provide care more accurately. Meanwhile, the items related to providing more patient care were inconsistent with our study (Andrew, n.d.). On the other hand, Poissant's study contradicts our study which revealed that the HIT consumed time

of physician and nurses in the activities related to documentation and (COPE) (Poissant et al., 2005).

The results show significant difference in respect to age group specially 25-35 age group and 36-50 age groups, profession type specially radiology technicians and participants have previous experience in using the CHMIS(P < 0.047), (P<0.04, (P< 0.001), and (P<P 0.<001) respectively. Consequently, these age groups represent most of study's population, where it's formulated from executive and supervisor staff. In addition they were engaged in daily implementation progress. Furthermore, most of local head committees called System Champions or CHMIS committee belong to this age group. As for professionals, the radiology technicians perceived positive perceptions toward the time and communication items, which reflect their enjoyment in the system, since they complain from shortage of staff. The experience of using HMIS and those who haven't experience in using HMIS denoted the same significant difference. The efficiency items are easier to measure and are considered as tangible items for measurement and observation than effectiveness items which need more empirical studies than descriptive.

The results are reasonable and justified since the two hospitals' management support and commitment led to a smooth implementation, as showed in the barriers. Accordingly, there is evidence linked efficiency of HIT applications with change management and management response to the needed essential inputs like structural change, resources allocation, decisions and high involvement in the implementation details (Musbah, 2010). The result of ease of use and efficiency denoted to highly efficient gains from implementing the system.

## 6.7 Extent of use of CHMIS's reports in decision making

The Efforts to improve monitoring and evaluation systems have been increasing. However data is often not used effectively by stakeholders to inform policy and programmatic decision making (Ekirapa, n.d.). Healthcare is information driven field. The caring of patients is relies on compilation of clinical findings and documentation, which enable the effective decision-making for clinical decisions and judgments (Adam, 2004). As medical care gets more and more complex and new information is already overwhelming physicians' capacity to treat

patients with the latest information and physicians need new technologies to help them (COPE) (IJACSA, 2011).

The rational and effective decisions rely on consistent data and reliable database (Musbah, 2010) Health decisions are diversified; either administrative or clinical decisions. The majority of participants (81%) agreed that the system helps in tracking the cost management and monitoring of health services provided for the patients and clients. In addition they agreed the CHMIS helps in enhancing the quality of decision making process and agreed on the impact of system on data accuracy and providing the information needed for decision making in suitable time. The positive perceptions may be explained by high need of the health sector for decision support systems (DSS).

Our results are consistent with similar study conducted by AHQR (2006) about the benefits gains from HIT, particularly from Electronic Health Record in providing the proper clinical data to be used in clinical decision.  It's clear that the positive perceptions come from the benefits gained from using the information technology. Significant differences were found in responses to radiology technicians and participants inexperienced in the use of HMIS. Radiology technicians and pharmacists believe that the system's reports have positive impact on monitoring the cost of services provided for the patients , providing accurate information for decision making , and  enhancing the decision making process ( P<0.003). Another significant difference was the participants inexperienced in using the HMIS. The result contradicted Keith's study which revealed that the physicians who have experience have strong tendency for positive attitude than who have less experience (Elder. et al., 2010). Complexity of work conditions made the automated systems very necessary for data in the health context, for the health worker.

## 6.8 Challenges of implementation

The history of successful CHMIS implementation is a long journey that started in the 1970s in the USA. Many national attempts of CHHIS have failed, the source of the problem stemmed from the gap between what the potential outcomes for the implemented CHMIS, and the effectiveness and efficiency of implementing that system. In short, the ideal CHMIS and

successful implementation was measured by the benefits gained, and the least challenges. Accordingly, the success differs from place to place, where availability of advanced information technology means more quality of care provided to the patients (IOM, 2012)., There are definitely no specific barriers and failure reasons for the implementation, but at least there are critical factors affecting the level of success (Adam, 2004). The critical factors of success or failure are usability, leadership, organizational-structure changes, technology, training and technical support. The statements in this domain were negatively worded. Musbah's study indicated the moderate importance of availability of computers as a challenge, which contradicts our study result. In fact; the availability of computers is not only the success of implementation, but it is also important to facilitate the business procedures and daily tasks (Musbah, 2010).

Moreover; the smooth change in management includes re-organizing the medical and administrative staff, and re- designing current procedures. It's clear that the trust comes from management support and follow-up. The significant difference is found in responses to challenges vs. profession type for the following items; Limited number of distributed computers in hospital's departments, (P <P 0.<001), insufficient working hours due to over workload (P <P 0.<001), Lack of financial support (P <0.003), Lack of supervision and management follow up (P <0.003).

The challenges of using the computerized CMIS can be categorized into financial, technical, time, physiological, social, legal, organizational, and change process (Boonstra&Brokehuis, 2010). Most of the published literature points out these barriers in the implementing. The Physicians and Nurses are the main front-line of user group in CHMIS. Physicians have more impact on the adoption and use of the system than other medical staff, i.e. nurses, administrators, pharmacists, laboratory technicians, and radiology technicians. In comparison with other countries our challenges were differ others like South. Where in South the main challenges was insufficient financing and training capacity (Peter, Jeremy & Linda , 2003), in addition to slowness of implementation in US is due to high resistance and lack of government efforts devoted to accelerate the momentum of implementation (Molly , 2013).

## 6.9 Conclusion

The study was set out to explore the users' perceptions toward the implemented CHMIS in the MoH hospitals according to their perspectives. Obviously, the results show that using a cutting-edge information technology in managing and monitoring health sector has a significant effect on the patient safety and eliminating errors as well as time management, and enhancing evidence-based decision making. The results shed the light on the users' skills and technology literacy. In addition, it helps in better understanding the main strengths and weaknesses for the implemented system from the users' view point. Efficient communication and documentation accuracy were positive items from the users' perspectives. An unexpected result was irrational using of resources as result of using the COPE. Priority should be given to retain and sustain the positive points. The study recommends the hospital management to investigate and improve the negative points. In addition, to use the system output in evidence-based decision making. However, the main challenges remain to be the lack of equipment and financial resources for the system from the users' perspectives.

## 7.0 Recommendations

**To Ministry of Health:**

1. Complete the implementation of CHMIS for the rest of MoH hospitals to gain the benefits of this technology especially on the national level
2. Adopting the CHMIS's output in decision making (evidence-based decision making) on the national level.
3. Including an item in the MoH budget to ensure sustainability of the CHMIS system operations and continuity.
4. Devoting particular efforts for users' performance to gain valid and reliable output.

**To Hospitals Management:**

1. Formulating medical and administrative committee for the hospital staff to increase awareness of users toward the importance of data quality especially for using ICD 10 in patient treatment
2. To devote efforts to factors affecting irrational use of resources (Laboratory, Radiology and Drug orders).
3. Conduct regular training for new users to be familiarized with the system's features and perform their tasks as fast as possible
4. Provide adequate infrastructure support for needed functional areas (Hospital Department), in addition to ensuring the continuity of regular maintenance for PCs, laptops, printers, and network

**Future Research**

1. Conducting more studies for systems that have an impact on economic effects, malpractice issues, and quality of data entered into systems.
2. Conducting comparative studies to address the benefits and gained values after and after implementing the system.
3. Conducting studies for quality of care provided for patients by reviewing the used ICD 10 codes inside the CHMIS and link them with efficient and effective issues like time efficiency and patient safety issues.

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**Annexes**

**Annex 1: Medical Staff (Physicians and Nurses) Questionnaire (English Version)**



**Dear Participant,**

This study has been designed to obtain a Master's degree in Health Policy and Management – Faculty of Public Health at Al-Quds University. Kindly fill out this questionnaire that aims to measure users perceptions on the impact of Computerized Health Management Information Systems (CHMIS) In terms of Effectiveness (Patient Safety, Male Practice and accurate diagnoses) and efficiency (Quick Communication, Effort saving, Reducing Number of Staff) decision making which enhance the confidence of the users toward CHMIS as a developmental tool to provide services for patients and improving users performance from another hand.

The questionnaire consists of statements and opinions related to the efficient and effectiveness of using CHMIS. There are five possible answers to each statement; Please Tick (X) under the appropriate answer. It will only take 10-15 minutes to answer.

Finally, please note that the participation in this study is voluntary and strictly confidential in terms of the identity of the participants. We would like to also inform you that the hospitals will not be able to know the identity of the participants under any condition since the data processing will be very general and nothing will be processed in particular.

Researcher: Mohammad M. Baniode / Al. Quds University-Jerusalem/ Faculty of Public Health.

## General Information:

**1. Gender**

○ Male          ○ Female

**2. Age:**

○ Less than 20 Years Old          ○ 21-35 Years Old          ○ 36-50 years old          ○ More than 50 years old

**b) Education:**

○ Secondary Certificate   ○ Diploma          ○ Bachelors          ○ Higher Diploma          ○ Higher Education
(Master's Degree, PHD)

**4. Years of Experience in Hospitals:**
○ Less than a year                    ○ 1-5 Years   ○ More, Specify

**5. Current Job:**
○ Physicians          ○ Nurse          ○ Laboratory Technician          ○ Radiologist          ○ Pharmacist

**6. Do you work in a supervisory Job (Manager, Head of Department, Supervisor…etc)?**

○ Yes, Specify……………………                    ○ No (Move to answer question No "7")

**7. In which department do you work?**
○ Medical                    ○ Nursing          ○ Paramedical (Radiology, Pharmacy, Laboratory)  , specify
……

**8. How Many Computers does your department have?**
○ 1-2 Computer          ○ 3-4 Computers          ○ 5-7 Computers          ○ More than 7 computers

**9. Do you have any previous experience in using computer?**

○ Yes                    ○ No

**10. How long have you been using CHMIS in Hospitals?**
○ Less Than 3 Months          ○ 4-7 months          ○ More than 8 months          ○ more than 11 months

**11. Did you use computerized health Management Information Systems (CHMIS) in any other hospitals before using it in this hospital?**
○ Yes                    ○ No
**12. Did the use of computerized health management information systems (CHMIS) contributed in developing your computer skills?**
○ Yes                              ○ No

**13. To what extent are you using CHMIS in your job?**
○ Always ○ Most of the Time          ○ Often          ○ little          ○ very little

1. **Tick (x) under the appropriate answer.**

## A) Users perception toward the ease of using CHMIS

| # | Statement | Agree | Strongly Agree | No Opinion | Don't Agree | Strongly Don't Agree |
|---|---|---|---|---|---|---|
| 1 | I can use CHMIS easily regardless to my years of experience and level of education. | 1 | 2 | 3 | 4 | 5 |
| 2 | CHMIS is easier than paper-base system in terms of documentation and communication. | 1 | 2 | 3 | 4 | 5 |
| 3 | CHMIS pop up warning messages reduce wrong transactions. | 1 | 2 | 3 | 4 | 5 |
| 4 | Correcting wrong transactions such as (Misspelling, Data Entry, and Orders) can be done easily through CHMIS | 1 | 2 | 3 | 4 | 5 |
| 5 | Frequent use of CHMIS contributes in reducing false entries. | 1 | 2 | 3 | 4 | 5 |

## B) Effectiveness Users Perception on the impact of CHMIS in terms of efficiency: Quick Communication, Effort saving, Reducing Staff Numbers)

| # | Statement | Agree | Strongly Agree | No Opinion | Don't Agree | Strongly don't agreeagree |
|---|---|---|---|---|---|---|
| 1 | CHMIS contributes in promoting patient safety culture. | 1 | 2 | 3 | 4 | 5 |
| 2 | CHMIS contributes in reducing malpractice in terms of diagnoses and treatment. | 1 | 2 | 3 | 4 | 5 |
| 3 | CHMIS improves accuracy compared with hand-writing. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | CHMIS reduces Malpractice resulted from lack of line clarity in comparison with hand-writing. | 1 | 2 | 3 | 4 | 5 |
| 5 | CHMIS helps in determining patient's identity in terms of: Full Name and ID Card No, which helps in reducing errors in ordering lab tests, medications and therapeutic procedures accurately. | 1 | 2 | 3 | 4 | 5 |
| 6 | CHMIS reduces the occurrence of errors in drug ordering by showing drug interactions and contradictions | 1 | 2 | 3 | 4 | 5 |
| 7 | CHMIS improves data safety and medical information and protects data from being lost. | 1 | 2 | 3 | 4 | 5 |
| 8 | CHMIS empowers accurate diagnoses by using international classification of diseases (ICD 10) which improves and increases safety of given diagnoses and treatment. | 1 | 2 | 3 | 4 | 5 |

## C) Users Perception on the impact of the CHMIS in terms of efficiency: Quick Communication, Effort saving, Reducing Staff Numbers)

| | Statement | Agree | Strongly Agree | No Opinion | Don't Agree | Strongly don't agree |
|---|---|---|---|---|---|---|
| 1 | CHMIS reduces time spent in diagnoses and documentation. | 1 | 2 | 3 | 4 | 5 |
| 2 | CHMIS contributes to the process of filling out forms and meets the necessary information from patients easily. | 1 | 2 | 3 | 4 | 5 |
| 3 | CHMIS facilitates the process of communication and arrangements between different staff members (Medical, Medical | 1 | 2 | 3 | 4 | 5 |

| # | | Statement | | | | | |
|---|---|---|---|---|---|---|---|
| 4 | | CHMIS facilitates the process of communication and arrangements between different departments (Medical, Paramedical and Administrative etc….) | | | | | |
| 5 | | CHMIS contributes in accessing medical registry very easily. | | | | | |
| 6 | | CHMIS prevents data and patients documents from loss. | | | | | |

## D) Users' Perceptions toward the challenges of using and implementing CHMIS

| # | Statement | Agree | Strongly Agree | No Opinion | Don't Agree | Strongly Dis agree |
|---|-----------|-------|----------------|------------|-------------|--------------------|
| 1 | Limited number of PCs in departments compared to the workload | 1 | 2 | 3 | 4 | 5 |
| 2 | Lack of Knowledge and skills in using CHMIS | 1 | 2 | 3 | 4 | 5 |
| 3 | Lack of confidence and capabilities of CHMIS. | 1 | 2 | 3 | 4 | 5 |
| 4 | Lack of awareness and Knowledge of the importance and usefulness of CHMIS | 1 | 2 | 3 | 4 | 5 |
| 5 | Lack of training for the staff to use CHMIS | 1 | 2 | 3 | 4 | 5 |
| 6 | Lack of support and empowerment from Management in terms of reinforcement, monitoring, orientation, etc… in the implantation of CHMIS. | 1 | 2 | 3 | 4 | 5 |
| 7 | Lack of financial resources to update CHMIS | 1 | 2 | 3 | 4 | 5 |
| 8 | Insufficient time for using CHMIS due to workload and shortage of staff. | 1 | 2 | 3 | 4 | 5 |
| 9 | Lack of logistics such as (Stationary and Ink) that support the sustainability of CHMIS. | 1 | 2 | 3 | 4 | 5 |

**E) Answer the following questions only if you hold a supervisory position (Manager, Supervisor, head of department, etc….)**

| # | Statement | Agree | Strongly Agree | No Opinion | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| 1 | CHMIS contributes in reducing employee's efforts in performing every day duties and employed it in a creative work. | 1 | 2 | 3 | 4 | 5 |
| 2 | CHMIS helps in developing employees' analytical and technical skills through reports and information generated by the system. | 1 | 2 | 3 | 4 | 5 |
| 3 | CHMIS helps in the process of organizing and distributing tasks (Roles and Responsibilities). | 1 | 2 | 3 | 4 | 5 |
| 4 | CHMIS helps in issuing administrative reports | 1 | 2 | 3 | 4 | 5 |
| 5 | CHMIS assist in computing the cost of services provided by hospital | 1 | 2 | 3 | 4 | 5 |
| 6 | CHMIS contributes in raising work and employee efficiency in terms of accuracy, time saving | 1 | 2 | 3 | 4 | 5 |
| 7 | CHMIS facilities communication between departments when making decisions | 1 | 2 | 3 | 4 | 5 |
| 8 | CHMIS helps in saving the efforts of information gathering to make decisions and present alternatives | 1 | 2 | 3 | 4 | 5 |
| 9 | CHMIS provides essential information in right time to be used in decision making | 1 | 2 | 3 | 4 | 5 |
| 10 | CHMIS provides the necessary data needed for decision making | 1 | 2 | 3 | 4 | 5 |
| 11 | CHMIS enhances the quality of decision making | 1 | 2 | 3 | 4 | 5 |

**Comments:**

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Researcher:

Mohammad Mahmoud Baniode, Al. Quds University, School of Public Health

Thanks

**Annex 2: Paramedical Staff (Laboratory, Radiology and Pharmacists) Questionnaire (English Version)**



**Dear Participant,**

This study has been designed to obtain a master's degree in Health Policy and Management – Faculty of Public Health at Al-Quds University. Kindly fill out this questionnaire that aims to measure Users perception on the impact of Computerized Health Management Information Systems (CHMIS) In terms of Effectiveness (Patient Safety, Male Practice and accurate diagnoses) and efficiency (Quick Communication, Effort saving, Reducing No Staff, and decision making which enhance the confidence of the users toward CHMIS as a developmental tool to provide services for patience and improving users performance from another hand.

The questionnaire consists of statements and opinions related to the efficient and effectiveness of using CHMIS. There are five possible answers to each statement; Please Tick (X) under the appropriate answer. It will only take 10-15 minutes to answer.

Finally, please note that the participation of this study is voluntary and strictly confidential in terms of the identity of the participants. We would like to also inform you that the hospitals will not know the identity of the participants under any condition since the data processing will be very general and nothing will be processed in particular.

Researcher: Mohammad M. Baniode / Al. Quds University-Jerusalem/ Faculty of Public Health.

## General Information:

**2. Gender**

○ Male        ○ Female

**2. Age:**

○ Less than 20 Years Old        ○ 21-35 Years Old        ○ 36-50 years old        ○ More than 50 years old

**c) Education:**

○ Secondary Certificate  ○ Diploma        ○ Bachelors        ○ Higher Diploma        ○ Higher Education (Master's Degree, PHD)

**4. Years of Experience in Hospitals:**
○ Less than a year                ○ 1-5 Years   ○ More, Specify

**5. Current Job:**
○ Physicians        ○ Nurse        ○ Laboratory Technician        ○ Radiologist        ○ Pharmacist

**6. Do you work in a supervisory Job (Manager, Head of Department, Supervisor…etc)?**

○ Yes, Specify……………………                ○ No (Move to answer question No "7")

**7. In which department do you work?**
○ Medical                ○ Nursing                ○ Paramedical (Radiology, Pharmacy, Laboratory)  , specify ……

**8. How Many Computers does your department have?**
○ 1-2 Computer        ○ 3-4 Computers        ○ 5-7 Computers        ○ More than 7 computers

**9. Do you have any previous experience in using a computer?**

○ Yes                ○ No

**10. How long have you been using CHMIS in Hospitals?**
○ Less Than 3 Months        ○ 4-7 months        ○ More than 8 months        ○ more than 11 months

**11. Did you use CHMIS in any other hospitals before using it in this hospital?**
○ Yes                ○ No

**12. Did the use of CHMIScontribute in developing your computer skills?**
○ Yes                                ○ No

**13. To what extent are you using CHMISin your job?**

○ Always ○ Most of the Time        ○ Often        ○ little        ○ very little

**2) Tick (x) under the appropriate answer.**

## A) Users perception toward the ease of using CHMIS

| # | Statement | Agree | Strongly Agree | No Opinion | Don't Agree | Strongly |
|---|-----------|-------|----------------|------------|-------------|----------|
| 1 | I can use CHMIS easily regardless of my years of experience and education level. | 1 | 2 | 3 | 4 | 5 |
| 2 | CHMIS is easier than paper-based system in terms of documentation and communication. | 1 | 2 | 3 | 4 | 5 |
| 3 | CHMIS pop up warning messages reducing wrong transactions. | 1 | 2 | 3 | 4 | 5 |
| 4 | Correcting wrong transactions such as (Misspelling, Data Entry, and Orders) can be done easily through computerized Health information systems. | 1 | 2 | 3 | 4 | 5 |
| 5 | Frequent use of Computerized Health Information System (CHMIS) contributes to reducing false entries. | 1 | 2 | 3 | 4 | 5 |

## B) Users' perception toward the system impact on using Computerized Order Physician system (COPE).

| # | Statement | Agree | Strongly Agree | No Opinion | Don't Agree | Strongly |
|---|-----------|-------|----------------|------------|-------------|----------|
| 1 | CHMIS contributes to patient safety in terms of reducing errors in medications. | 1 | 2 | 3 | 4 | 5 |
| 2 | **CHMIS contributes to reducing time between medical departments.** | 1 | 2 | 3 | 4 | 5 |
| 3 | **CHMIS contributes to reducing the laboratory, Pharmacy and radiology requests.** | 1 | 2 | 3 | 4 | 5 |

| 4 | CHMIS reduces unnecessary and repeated tests. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 5 | CHMIS contributes in determining the necessary tests and medication accurately compared with paper based. | 1 | 2 | 3 | 4 | 5 |
| 6 | CHMIS facilitates the process of communication and arrangements between physicians and paramedical departments (Laboratory, Radiology and Pharmacy). | 1 | 2 | 3 | 4 | 5 |
| 7 | CHMIS increases the patients satisfaction of the services. | 1 | 2 | 3 | 4 | 5 |

## C) Users Perception on the impact of the CHMIS in terms of efficiency: Quick Communication, Effort saving, Reducing Staff Numbers)

| | | Agree | Strongly Agree | No Opinion | Don't Agree | Strongly don't agree |
|---|---|---|---|---|---|---|
| 1 | CHMIS reduces time spent in diagnoses and documentation. | 1 | 2 | 3 | 4 | 5 |
| 2 | CHMIS contributes to the process of filling out forms and meets the necessary information from patients easily. | 1 | 2 | 3 | 4 | 5 |
| 3 | CHMIS facilitates the process of communication and arrangements between different staff members (Medical, Medical Support and Administrative etc….) | 1 | 2 | 3 | 4 | 5 |
| 4 | CHMIS facilitates the process of communication and arrangements between different departments (Medical, Paramedical and Administrative etc….) | 1 | 2 | 3 | 4 | 5 |
| 5 | CHMIS contributes in accessing medical registry very easily. | 1 | 2 | 3 | 4 | 5 |
| 6 | CHMIS prevents from losing data and patient documents. | 1 | 2 | 3 | 4 | 5 |

## D) Challenges According to Users Perception

| # | Statement | Agree | Strongly Agree | No Opinion | Don't Agree | Strongly Dis agree |
|---|---|---|---|---|---|---|
| 1 | Limited number of PCs in departments compared to the workload | 1 | 2 | 3 | 4 | 5 |
| 2 | Lack of Knowledge and skills in using CHMIS | 1 | 2 | 3 | 4 | 5 |
| 3 | Lack of confidence and capabilities of CHMIS. | 1 | 2 | 3 | 4 | 5 |
| 4 | Lack of awareness and knowledge of the importance and usefulness of CHMIS | 1 | 2 | 3 | 4 | 5 |
| 5 | Lack of training for the staff to use CHMIS | 1 | 2 | 3 | 4 | 5 |
| 6 | Lack of support and empowerment from Management in terms of (reinforcement, monitoring, orientation, etc….) in the implantation of CHMIS. | 1 | 2 | 3 | 4 | 5 |
| 7 | Lack of financial resources to update CHMIS | 1 | 2 | 3 | 4 | 5 |
| 8 | Insufficient time for using CHMIS due to workload and shortage of staff. | 1 | 2 | 3 | 4 | 5 |
| 9 | Lack of logistics such as (Stationary and Ink) that support the sustainability of CHMIS. | 1 | 2 | 3 | 4 | 5 |

**Answer this question if you are only working in a supervisory position (Manager, Supervisor, head of department, etc….)**

| # | Statement | Agree | Strongly Agree | No Opinion | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| 1 | CHMIS contributes in reducing employee's efforts in performing every day duties to employed these efforts creative work. | 1 | 2 | 3 | 4 | 5 |
| 2 | CHMIS helps in developing the analytical and technical skills of the employees through reports and information generated by the system. | 1 | 2 | 3 | 4 | 5 |

| 3 | CHMIS helps in the process of organizing and distributing tasks (Roles and Responsibilities). | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 4 | CHMIS helps in issuing administrative reports | 1 | 2 | 3 | 4 | 5 |
| 5 | CHMIS assists in computing the cost of services provided by the hospital | 1 | 2 | 3 | 4 | **5** |
| 6 | CHMIS contributes in raising the efficiency of work and employees in terms of accuracy and saving time. | 1 | 2 | 3 | 4 | 5 |
| 7 | CHMIS facilitates communication between departments when making decisions | 1 | 2 | 3 | 4 | 5 |
| 8 | CHMIS helps in saving the efforts of information gathering to make decisions and present alternatives | 1 | 2 | 3 | 4 | 5 |
| 9 | CHMIS provides essential information in the right time to be used in decision making | 1 | 2 | 3 | 4 | 5 |
| 10 | CHMIS provides the necessary data needed for decision making | 1 | 2 | 3 | 4 | 5 |
| 11 | CHMIS enhances the quality of decision making | 1 | 2 | 3 | 4 | 5 |

**Comments:** --------------------------------------------------------------------------------
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Researcher:

Mohammad Mahmoud Baniode, Al. Quds University, School of Public Health

Annex 3: Medical Staff (Physicians and Nurses) Questionnaire (Arabic Version)



**جامعة القدس ــ فلسطين**

**عمادة الدراسات العليا**
**كلية الصحة العامة ــ برنامج السياسات و الإدارة الصحية**
**نسخة الطاقم الطبي (الاطباء و الممرضين)**

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**دراسة : تقييم نظام المعلومات الصحي المحوسب في مستشفيات وزارة الصحة الفلسطينية : وجهات نظر العاملين في مستشفيات نابلس و قلقيلية**

**عزيزي المشارك في هذه الدراسة**
**تحية طيبة و بعد،**

هذه الدراسة هي احدى المتطلبات الدراسية للحصول على درجة الماجستير في السياسات و الادارة الصحية ـ كلية الصحة العامة في جامعة القدس، راجيا منكم التعاون في تعبئة هذا الاستبيان و الذي يهدف الى التعرف على وجهات نظر العاملين حول اثر تطبيق نظام المعلومات الصحي المحوسب (CHMIS ) في المستشفى و ذلك من حيث : الكفاءة و تشمل السرعة في التواصل، و توفير الجهد، واختزال الطواقم و ترشيد استخدام الموارد. و الفاعلية و تشمل سلامة المرضى، و تقليل الاخطاء الطبية ، و دقة التشخيص، بالاضافة الى اثر هذه الانظمة على عملية صنع القرار والسياسات الصحية، الامر الذي يعزز من ثقة المستخدمين بنظام المعلومات الصحي المحوسب كأحد الادوات التطويرية و التحسينية لتقديم الخدمة للمرضى من جهة و تحسين أداء العاملين من جهة اخرى .

تتكون الاستبانة من بعض العبارات و الآراء ذات العلاقة بكفاءة و فاعلية استخدام نظام المعلومات الصحي المحوسب (CHMIS) لكل جملة خمسة أجوبة ممكنه، الرجاء اختيار الاجابة التي تتوافق مع رأيك الخاص بتضليل المربع المناسب. تستغرق اجابة هذه الاستبانة من ١٠ ــ ١٥ دقيقة.
و أخيراً، نود أن ننوه الى أن المشاركة في الدراسة طوعية و أن السرية التامة حول هوية الشخص الذي قام بتعبئة الاستبانة مضمونة في هذا البحث. كذلك نود اعلامكم بانه لن يكون بمقدور إدارة المشفى أو الباحثون معرفة هوية المشاركين في البحث، حيث ستتم معالجة المعلومات بشكل عام وليس بشكل خاص. و نشكر لكم حسن تعاونكم.
**الباحث: محمد محمود بني عودة ، جامعة القدس، كلية الصحة العامة.**

**معلومات تعريفية:**

1. الجنس : ☐ ذكر ☐ أنثى

2. العمر : ☐ أقل من 20سنة ☐ 21-35 سنة ☐ 36- 50 سنة ☐اكثر من 50 سنة

3. المؤهل العلمي : ☐ ثانوية عامة ☐ دبلوم ☐ بكالوريوس ☐دبلوم عالي ☐دراسات عليا (ماجستير، دكتوراة )

4. عدد سنوات خبرتك في المستشفى : ☐أقل من سنة ☐1-5 سنوات ☐ أكثر من ذلك، حدد...................

5. وظيفتك الحالية هي ؟ ☐ طبيب ☐ممرض ☐ فني مختبر ☐ فني اشعة ☐ صيدلاني

6. هل تعمل في وظيفة اشرافية ( مدير، رئيس قسم، مشرف ..الخ )؟
☐نعم ، حدد ........................ ☐ لا (اذا كانت الاجابة "لا" انتقل الى السؤال رقم 7)

7. ما هي طبيعة القسم الذي تعمل فيه؟ ☐ طبي ☐ تمريضي ☐ طبي مساند ( أشعة، مختبر، صيدلية)
إذا كان طبي مساند ، حدد ...........................

8. كم عدد الاجهزة في قسمك؟ ☐1-2 ☐ 3-4 ☐ 5-7 ☐ 7 فأكثر

9. هل لديك أي خبرة سابقة في استخدام الحاسوب ؟ ☐ نعم ☐ لا

10. منذ متى و انت تستخدم النظام الصحي المحوسب (CHMIS) في المستشفى؟
☐ أقل من 3 شهور ☐4-7 شهور ☐ 8-10 ☐11 شهر فأكثر

11. هل استخدمت انظمة صحية محوسبة في مستشفيات اخرى قبل استخدامها في هذا المستشفى؟
☐ نعم ☐ لا

12. هل ساهم استخدام النظام الصحي المحوسب (CHMIS) في تطويرمهارات استخدام الحاسوب لديك ؟
☐ نعم ☐ لا

13. ما مدى استخدامك لنظم المعلومات الصحية المحوسبة في عملك؟
☐ دائماً☐ معظم الوقت ☐ أحيانا ☐قليل ☐ قليل جدا

**اسم المستشفى** _____

**الرجاء ان تختار مدى موفقتك او رفضك للجمل التالية فيما يتعلق ياستخدام النظام الصحي المحوسب.**

أ. وجهات نظر العاملين ( المهن الطبية المساندة) حول سهولة استخدام النظام

| أوافق | أوافق | محايد | أعارض | أعارض بشدة | العبارة / السؤال | الرقم |
|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 | أستطيع استخدام نظام المعلومات الصحية المحوسب(CHMIS) بسهولة بغض النظر عن عدد سنوات خبرتي و مستواي التعليمي. | 1 |
| 5 | 4 | 3 | 2 | 1 | يعتبر نظام المعلومات الصحية المحوسب (CHMIS) اسهل من النظام الورقي السابق من حيث التوثيق و التواصل . | 2 |
| 5 | 4 | 3 | 2 | 1 | تساعد رسائل التحذير المنبثقة من النظام (CHMIS)على تقليل الحركات الخاطئة. | 3 |
| 5 | 4 | 3 | 2 | 1 | يتم التعامل مع تصحيح الاخطاء (الكتابة ،الادخالات ،الطلبات) بسهولة من خلال النظام المحوسب. | 4 |
| 5 | 4 | 3 | 2 | 1 | تزيد كثرة الممارسة في استخدام النظام المحوسب (CHMIS) من تقليل الادخالات الخاطئة مع مرور الوقت | 5 |

ب. الفاعلية : سلامة المرضى، تقليل الاخطاء الطبية، دقة التشخيص

| أوافق | أوافق | محايد | أعارض | أعارض بشدة | العبارة / السؤال | الرقم |
|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 | يساهم النظام الصحي المحوسب (CHMIS) في تعزيز ثقافة سلامة المرضى | 1 |
| 5 | 4 | 3 | 2 | 1 | يساهم النظام الصحي المحوسب(CHMIS) في تقليل الاخطاء الطبية فيما يتعلق بالتشخيص و العلاج | 2 |
| 5 | 4 | 3 | 2 | 1 | يحسن النظام الصحي المحوسب(CHMIS) من دقة التوثيق بالمقارنة مع الكتابة اليدوية | 3 |
| 5 | 4 | 3 | 2 | 1 | يقلل النظام الصحي المحوسب(CHMIS) من الاخطاء الطبية التي تنتج عن عدم وضوح الخط مقارنة بالكتابة اليدوية | 4 |
| 5 | 4 | 3 | 2 | 1 | يساعد النظام الصحي المحوسب (CHMIS) في تحديد هوية المريض بشكل دقيق من ناحية : الاسم الرباعي، رقم هوية المريض الامر الذي يساعد في تقليل فرص الخطأ في طلب الفحوصات و الادوية و الاجراءات العلاجية بشكل دقيق | 5 |
| 5 | 4 | 3 | 2 | 1 | يقلل النظام الصحي المحوسب (CHMIS) من حدوث الأخطاء في طلب الأدوية من خلال اظهار التعارضات و التضاربات الدوائية Drug-Drug Interaction and Drug Contra-Indications | 6 |
| 5 | 4 | 3 | 2 | 1 | يحسن النظام الصحي المحوسب (CHMIS) من مأمونية نقل و تبادل المعلومات الطبية | 7 |

| الرقم | العبارة / السؤال | أعارض بشدة | أعارض | محايد | أوافق | أوافق |
|---|---|---|---|---|---|---|
| 8 | يعزز النظام الصحي المحوسب (CHMIS) في دقة التشخيص من خلال استخدام الامراض النظام الدولي لتصنيف الامراض ICD 10الموجود في النظام. | 1 | 2 | 3 | 4 | 5 |

ث. وجهات نظر العاملين حول الكفاءة: (السرعة في التواصل ، توفير الجهد،  اختزال الطواقم )

| الرقم | العبارة / السؤال | أعارض بشدة | أعارض | محايد | أوافق | أوافق |
|---|---|---|---|---|---|---|
| 1 | يقلل النظام الصحي المحوسب (CHMIS) من الوقت المستهلك في التوثيق و التشخيص | 1 | 2 | 3 | 4 | 5 |
| 2 | يسهل النظام الصحي المحوسب  (CHMIS) في عملية تعبئة النماذج واستيفاء المعلومات اللازمة من المراجعين | 1 | 2 | 3 | 4 | 5 |
| 3 | يختزل النظام الصحي المحوسب  (CHMIS) من الجهد و الوقت اللازم للحصول على المعلومات و تبادلها بين الطواقم | 1 | 2 | 3 | 4 | 5 |
| 4 | يسهل النظام الصحي المحوسب (CHMIS) من عملية الاتصال والتنسيق ما بين الاقسام المختلفة (الطبية، الطبية المساندة و الادارية ، الخ) | 1 | 2 | 3 | 4 | 5 |
| 5 | يسهل و يسرع النظام الصحي المحوسب (CHMIS) في عملية الوصول إلى السجل الطبي | 1 | 2 | 3 | 4 | 5 |
| 6 | يساهم النظام الصحي المحوسب (CHMIS)  في الحيلولة دون ضياع البيانات و الوثائق المتعلقة بالمرضى | 1 | 2 | 3 | 4 | 5 |

ج. وجهات نظر العاملين حول التحديات من استخدام النظام الصحي المحوسب (CHMIS)

| الرقم | العبارة / السؤال | أعارض بشدة | أعارض | محايد | أوافق | أوافق |
|---|---|---|---|---|---|---|
| 1 | قلة أعداد أجهزة الحاسوب المتوفرة في الأقسام المختلفة مقارنة مع حجم العمل | 1 | 2 | 3 | 4 | 5 |
| 2 | نقص المعرفة والمهارة في استخدام النظام الصحي المحوسب (CHMIS) | 1 | 2 | 3 | 4 | 5 |
| 3 | نقص الثقة بامكانيات وقدرات النظام الصحي المحوسب(CHMIS) | 1 | 2 | 3 | 4 | 5 |
| 4 | نقص المعرفة باهمية و فائدة تطبيق النظام الصحي المحوسب (CHMIS) واستخداماته | 1 | 2 | 3 | 4 | 5 |
| 5 | عدم توفير التدريب الكافي للموظفين لاستخدام النظام الصحي المحوسب (CHMIS) | 1 | 2 | 3 | 4 | 5 |
| 6 | ضعف الدور الريادي للادارة ( التحفيز ، التوجيه ، الرقابة ، الخ ...) في عملية تطبيقالنظام الصحي المحوسب (CHMIS) | 1 | 2 | 3 | 4 | 5 |
| 7 | ضعف الإعتمادات المالية المطلوبة لتوفير وتحديث النظام الصحي المحوسب (CHMIS) | 1 | 2 | 3 | 4 | 5 |
| 8 | عدم كفاية وقت الاستخدام بسبب ضغط العمل و نقص الكوادر | 1 | 2 | 3 | 4 | 5 |

| 9 | نقص الامكانات والمستلزمات المادية (الحبر والقرطاسية) التي تساعد على ديمومةاستخدام النظام الصحي المحوسب (CHMIS) | 1 | 2 | 3 | 4 | 5 |

د. إذا كنت تعمل في وظيفة اشرافية (مدير طبي ،مدير اداري ، رئيس قسم ،مشرف ، الخ ) ، يرجى منك الاجابة عن هذا السؤال

| الرقم | العبارة / السؤال | أعارض بشدة | أعارض | محايد | أوافق | أوافق |
|---|---|---|---|---|---|---|
| 1 | يساعد النظام الصحي المحوسب (CHMIS) على اختزال جهود الموظفين ذات الطابع الروتيني وتوظيفها في الأعمال الإبداعية. | 1 | 2 | 3 | 4 | 5 |
| 2 | يساعد النظام الصحي المحوسب(CHMIS) على تنمية المهارات التحليلية والفنية للموظفين من خلال التقارير و المعلومات التي يعرضها. | 1 | 2 | 3 | 4 | 5 |
| 3 | يساعد النظام الصحي المحوسب (CHMIS) في عملية تنظيم و توزيع الوظائف (المهام والمسؤوليات | 1 | 2 | 3 | 4 | 5 |
| 4 | يساعد النظام الصحي المحوسب (CHMIS) في إعداد التقارير الادارية | 1 | 2 | 3 | 4 | 5 |
| 5 | يساعد النظام الصحي المحوسب (CHMIS) على عملية حساب تكاليف الخدمات المختلفة التي يقدمها المستشفى. | 1 | 2 | 3 | 4 | 5 |
| 6 | يساهم النظام الصحي المحوسب (CHMIS) في رفع كفاءة العمل والعاملين من ناحية دقة انجاز المهام و اختزال الوقت اللازم لتنفيذها و توثيقها | 1 | 2 | 3 | 4 | 5 |
| 7 | يساعد النظام الصحي المحوسب (CHMIS) في عملية تبادل المعلومات المتعلقة بصنع القرار بين مختلف الدوائر والأقسام. | 1 | 2 | 3 | 4 | 5 |
| 8 | يساعد النظام الصحي المحوسب (CHMIS)على توفير الجهد في جمع المعلومات اللازمة ومقارنة البدائل لاخذ القرار | 1 | 2 | 3 | 4 | 5 |
| 9 | يقدم النظام الصحي المحوسب (CHMIS) المعلومات الضرورية لصناع القرار في الوقت اللازم | 1 | 2 | 3 | 4 | 5 |
| 10 | يوفر النظام الصحي المحوسب (CHMIS)جميع المعلومات التي أحتاج إليها لصنع القرار بشكل دقيق | 1 | 2 | 3 | 4 | 5 |
| 11 | يحسن النظام الصحي المحوسب (CHMIS)من نوعية القرارات المتخذة. | 1 | 2 | 3 | 4 | 5 |

## الملاحظات ان وجدت :

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Annex 4: Paramedical Staff (Laboratory, Radiology and Pharmacists) Questionnaire (Arabic Version)



**جامعة القدس ــ فلسطين**
**عمادة الدراسات العليا**
**كلية الصحة العامة ــ برنامج السياسات و الإدارة الصحية**
**نسخة المهن الطبية المساندة**

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**دراسة : تقييم نظام المعلومات الصحي المحوسب في مستشفيات وزارة الصحة الفلسطينية : وجهات نظر العاملين نابلس و قلقيلية نموذجا**

عزيزي المشارك في هذه الدراسة
تحية طيبة و بعد،

هذه الدراسة هي احدى المتطلبات الدراسية للحصول على درجة الماجستير في السياسات والادارة الصحية ــ كلية الصحة العامة في جامعة القدس، راجيا منكم التعاون في تعبئة هذا الاستبيان و الذي يهدف الى التعرف على وجهات نظر العاملين حول اثر تطبيق النظام الصحي المحوسب (CHMIS) في المستشفى و ذلك من ناحيتين : الناحية الأولى: الكفاءة و التي تشمل السرعة في التواصل ، و توفير الجهد، و اختزال الطواقم و ترشيد استخدام الموارد. الناحية الثانية: الفاعلية و التي تشمل سلامة المرضى، و تقليل الاخطاء الطبية ، و دقة التشخيص، بالاضافة الى اثر هذه الانظمة على عملية صنع القرار والسياسات الصحية، الامر الذي يعزز من ثقة المستخدمين بالنظام الصحي المحوسب كاحد الادوات التطويرية و التحسينية لتقديم الخدمة للمرضى من جهة و تحسين أداء العاملين من جهة اخرى .

تتكون الاستبانة من بعض المقولات و الآراء ذات علاقة بكفاءة و فاعلية استخدام النظام الصحي المحوسب CHMIS. لكل مقولة/ جملة و خمسة أجوبة ممكنه، الرجاء اختيار الاجابة التي تتوافق مع رأيك الخاص بتضليل المربع المناسب. تستغرق اجابة هذه الاستبانة من ١٠ ــ ١٥ دقيقة.

و أخيراً، نود أن ننوه الى أن المشاركة في الدراسة طوعية و أن السرية التامة حول هوية الشخص الذي قام بتعبئة الاستبانة مضمونة في هذا البحث. كذلك نود اعلامكم بانه لن يكون بمقدور إدارة المشفى أو الباحثون معرفة هوية المشاركين في البحث، حيث ستتم معالجة المعلومات بشكل عام وليس بشكل خاص.نشكر لكم حسن تعاونكم.

**الباحث: محمد بني عودة جامعة القدس، كلية الصحة العامة.**

**الرجاء ان تختار مدى موفقتك او رفضك للجمل التالية فيما يتعلق ياستخدام النظام الصحي المحوسب.**

ت. وجهات نظر العاملين ( المهن الطبية المساندة) حول سهولة استخدام النظام

| الرقم | العبارة / السؤال | أعارض بشدة | أعارض | محايد | أوافق | أوافق بشدة |
|---|---|---|---|---|---|---|
| 1 | أستطيع استخدام نظام المعلومات الصحية المحوسب(CHMIS) بسهولة بغض النظر عن عدد سنوات خبرتي و مستواي التعليمي. | 1 | 2 | 3 | 4 | 5 |
| 2 | يعتبر نظام المعلومات الصحية المحوسب (CHMIS) اسهل من النظام الورقي السابق من حيث التوثيق و التواصل . | 1 | 2 | 3 | 4 | 5 |
| 3 | تساعد رسائل التحذير المنبثقة من النظام (CHMIS)على تقليل الحركات الخاطئة. | 1 | 2 | 3 | 4 | 5 |
| 4 | يتم التعامل مع تصحيح الاخطاء (الكتابة ،الادخالات ،الطلبات) بسهولة من خلال النظام المحوسب. | 1 | 2 | 3 | 4 | 5 |
| 5 | تزيد كثرة الممارسة في استخدام النظام المحوسب (CHMIS) من تقليل الادخالات الخاطئة مع مرور الوقت | 1 | 2 | 3 | 4 | 5 |

ث. وجهات نظر العاملين حول اثر النظام المحوسب (CHMIS) على كمية و نوعية الطلبات التشخيصية والعلاجية( الفحوص المخبرية ،صور الاشعة، و الأدوية، الخ)

| الرقم | **العبارة / السؤال** | أعارض بشدة | أعارض | محايد | أوافق | أوافق بشدة |
|---|---|---|---|---|---|---|
| 1 | يساعد نظام الطلبات الاليكتروني في زيادة تحقيق سلامة المرضى من ناحية تقليل صرف الادوية الخاطئة | 1 | 2 | 3 | 4 | 5 |
| 2 | يساعد نظام الطلبات الاليكتروني في تقليل الوقت اللازم في عملية اجراء الفحوصات (المختبر و الاشعة ) و صرف الادوية | 1 | 2 | 3 | 4 | 5 |
| 3 | يساهم النظام المحوسب (CHMIS) في ترشيد طلب الفحوصات ( مختبر و اشعة) و الادوية | 1 | 2 | 3 | 4 | 5 |
| 4 | يقلل النظام المحوسب من طلب الفحوصات غير الضرورية والمكررة | 1 | 2 | 3 | 4 | 5 |
| 5 | يساعد النظام المحوسب في تحديد الفحوصات و الادوية المطلوبة بدقة اكثر من النظام الورقي السابق | 1 | 2 | 3 | 4 | 5 |
| 6 | يزيد نظام الطلبات الاليكتروني من سرعة التواصل بين الاطباء و الاقسام الطبية المساندة ( المختبر و الاشعة و الصيدلية الخ) | 1 | 2 | 3 | 4 | 5 |
| 7 | يساعد نظام الطلبات الاليكتروني في زيادة رضى المرضى من الخدمات المقدمة | 1 | 2 | 3 | 4 | 5 |

ح. وجهات نظر العاملين حول الكفاءة: (السرعة في التواصل ، توفير الجهد، اختزال الطواقم )

| الرقم | العبارة / السؤال | أعارض بشدة | أعارض | محايد | أوافق | أوافق بشدة |
|---|---|---|---|---|---|---|
| 1 | يقلل النظام الصحي المحوسب (CHMIS) من الوقت المستهلك في التوثيق و التشخيص | 1 | 2 | 3 | 4 | 5 |
| 2 | يسهل النظام الصحي المحوسب (CHMIS) في عملية تعبئة النماذج واستيفاء المعلومات اللازمة من المراجعين | 1 | 2 | 3 | 4 | 5 |
| 3 | يختزل النظام الصحي المحوسب (CHMIS) من الجهد و الوقت اللازم للحصول على المعلومات و تبادلها بين الطواقم | 1 | 2 | 3 | 4 | 5 |
| 4 | يسهل النظام الصحي المحوسب (CHMIS) من عملية الاتصال والتنسيق ما بين الاقسام المختلفة (الطبية، الطبية المساندة و الادارية ، الخ) | 1 | 2 | 3 | 4 | 5 |
| 5 | يسهل و يسرع النظام الصحي المحوسب (CHMIS) في عملية الوصول إلى السجل الطبي | 1 | 2 | 3 | 4 | 5 |
| 6 | يساهم النظام الصحي المحوسب (CHMIS) في الحيلولة دون ضياع البيانات و الوثائق المتعلقة بالمرضى | 1 | 2 | 3 | 4 | 5 |

خ. وجهات نظر العاملين حول التحديات من استخدام النظام الصحي المحوسب (CHMIS)

| الرقم | العبارة / السؤال | أعارض بشدة | أعارض | محايد | أوافق | أوافق بشدة |
|---|---|---|---|---|---|---|
| 1 | قلة أعداد أجهزة الحاسوب المتوفرة في الأقسام المختلفة مقارنة مع حجم العمل | 1 | 2 | 3 | 4 | 5 |
| 2 | نقص المعرفة والمهارة في استخدام النظام الصحي المحوسب (CHMIS) | 1 | 2 | 3 | 4 | 5 |
| 3 | نقص الثقة بامكانيات وقدرات النظام الصحي المحوسب(CHMIS) | 1 | 2 | 3 | 4 | 5 |
| 4 | نقص المعرفة باهمية و فائدة تطبيق النظام الصحي المحوسب (CHMIS) واستخداماته | 1 | 2 | 3 | 4 | 5 |
| 5 | عدم توفير التدريب الكافي للموظفين لاستخدام النظام الصحي المحوسب (CHMIS) | 1 | 2 | 3 | 4 | 5 |
| 6 | ضعف الدور الريادي للادارة ( التحفيز ، التوجيه ، الرقابة ، الخ ...) في عملية تطبيقالنظام الصحي المحوسب (CHMIS) | 1 | 2 | 3 | 4 | 5 |
| 7 | ضعف الإعتمادات المالية المطلوبة لتوفير وتحديث النظام الصحي المحوسب (CHMIS) | 1 | 2 | 3 | 4 | 5 |
| 8 | عدم كفاية وقت الاستخدام بسبب ضغط العمل و نقص الكوادر | 1 | 2 | 3 | 4 | 5 |
| 9 | نقص الامكانات والمستلزمات المادية (الحبر والقرطاسية) التي تساعد على ديمومةاستخدام النظام الصحي المحوسب (CHMIS) | 1 | 2 | 3 | 4 | 5 |

د. إذا كنت تعمل في وظيفة اشرافية (مدير طبي ،مدير اداري ، رئيس قسم ،مشرف ، الخ ) ، يرجى منك

| أوافق بشدة | أوافق | محايد | أعارض | أعارض بشدة | العبارة / السؤال | الرقم |
|---|---|---|---|---|---|---|
| | | | | | الإجابة عن هذا السؤال | |
| 5 | 4 | 3 | 2 | 1 | يساعد النظام الصحي المحوسب (CHMIS) على اختزال جهود الموظفين ذات الطابع الروتيني وتوظيفها في الأعمال الإبداعية. | 1 |
| 5 | 4 | 3 | 2 | 1 | يساعد النظام الصحي المحوسب(CHMIS) على تنمية المهارات التحليلية والفنية للموظفين من خلال التقارير و المعلومات التي يعرضها. | 2 |
| 5 | 4 | 3 | 2 | 1 | يساعد النظام الصحي المحوسب (CHMIS) في عملية تنظيم و توزيع الوظائف (المهام والمسؤوليات | 3 |
| 5 | 4 | 3 | 2 | 1 | يساعد النظام الصحي المحوسب (CHMIS) في إعداد التقارير الادارية | 4 |
| 5 | 4 | 3 | 2 | 1 | يساعد النظام الصحي المحوسب (CHMIS) على عملية حساب تكاليف الخدمات المختلفة التي يقدمها المستشفى. | 5 |
| 5 | 4 | 3 | 2 | 1 | يساهم النظام الصحي المحوسب (CHMIS) في رفع كفاءة العمل والعاملين من ناحية دقة انجاز المهام و اختزال الوقت اللازم لتنفيذها و توثيقها | 6 |
| 5 | 4 | 3 | 2 | 1 | يساعد النظام الصحي المحوسب (CHMIS) في عملية تبادل المعلومات المتعلقة بصنع القرار بين مختلف الدوائر والأقسام. | 7 |
| 5 | 4 | 3 | 2 | 1 | يساعد النظام الصحي المحوسب (CHMIS)على توفير الجهد في جمع المعلومات اللازمة ومقارنة البدائل لاخذ القرار | 8 |
| 5 | 4 | 3 | 2 | 1 | يقدم النظام الصحي المحوسب (CHMIS) المعلومات الضرورية لصناع القرار في الوقت اللازم | 9 |
| 5 | 4 | 3 | 2 | 1 | يوفر النظام الصحي المحوسب (CHMIS)جميع المعلومات التي أحتاج إليها لصنع القرار بشكل دقيق | 10 |
| 5 | 4 | 3 | 2 | 1 | يحسن النظام الصحي المحوسب (CHMIS)من نوعية القرارات المتخذة. | 11 |

## الملاحظات ان وجدت :

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Annex 5: Al-Quds University request Letter for conducting the study in the MoH hospitals

**Al-Quds University**

Jerusalem

**School of Public Health**

جامعة القدس

القدس

كلية الصحة العامة

التاريخ: 2012/4/1

الرقم: ك ص ع/١٣٥/١١/2012

حضرة الدكتور سعيد الهموز المحترم

مدير عام التعليم الصحي/ وزارة الصحة الفلسطينية

<u>الموضوع: مساعدة الطالب محمد بني عودة</u>

تحية طيبة و بعد،

يقوم الطالب محمد بني عودة بإجراء بحث كمتطلب لرسالة الماجستير في برنامج ماجستير السياسات والإدارة الصحية/ كلية الصحة العامة/ جامعة القدس بعنوان :

"Assessment of the health information system introduced in the Ministry of Health Hospitals: User's perceptions"

يهدف هذا البحث الى  تقييم نظام المعلومات الصحية المحوسب الذي تم تطبيقه في مؤسسات وزارة الصحة مؤخراً وتحديداً مستشفى رفيديا وقلقيلية من وجهة نظر جميع مستخدمي النظام. نرجو من حضرتكم مساعدة الطالب في وتسهيل مهمته في توزيع استبانه الدراسة على المعنيين.

سيتم البحث العلمي بإشراف  الدكتور  معتصم حمدان من كلية الصحة العامة، الرجاء الاتصال به في حال الحاجة لمزيد من المعلومات (0599-736929  mhamdan@med.alquds.edu).

مرفق طيه نسخة عن استبانة الدراسة

و تقبلوا بقبول فائق الاحترام،،

Faculty of Health

نسخة: الملف

Jerusalem Branch/Telefax 02-2799234

Gaza Branch/Telefax 08-2878166,2878177

P.O. box 51000 Jerusalem

فرع القدس / تلفاكس 02-2799234

فرع غزة / تلفاكس 08-2878166-2878177

ص.ب. 51000 القدس

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Annex 6: Permission letter from the General Directorate of Hospitals – Palestine

**Palestinian National Authority**

**Ministry of Health - Nablus**

**General Directorate of Higher &**

**Continuing Education**

السلطة الوطنية الفلسطينية
وزارة الصحة- نابلس

الإدارة العامة للتعليم الصحي

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

الرقم: .....................
التاريخ: .....................

الأخ مدير عام الإدارة العامة للمستشفيات المحترم،،،

تحية واحتراما،،،

<u>الموضوع: تسهيل مهمة</u>

تماشياً مع سياسة وزارة الصحة المتعلقة بتعزيز التعاون مع الجامعــات والمؤسسـات الأكاديمية بإتاحة فرص التدريب أمام الطلبة والخريجين والباحثين في المؤسســات الوطنيــة وإسهاماً في تنمية قدراتهم.

يرجى تسهيل مهمة طالب الماجستير **محمد بني عودة** – برنامج ماجستير السياسات والإدارة الصحية/ **جامعة القدس** بتوزيع استبانه على مستخدمي نظام المعلومات المحوسب الذي تم تطبيقه في مستشفيات وزارة الصحة تحديداً (م. رفيديا، م. قلقيلية) وذلك لإتمام رسالة الماجستير بعنوان " Assessment of the Health Information System Introduced

in the Ministry of Health Hospitals: User's Perceptions

مرفق: نسخة عن الاستبانة.

– شريطة موافاتنا بنسخة من النتائج عند اتمام البحث

مـــع الاحتــرام،،،

الدكتــور سعيد الهموز
مديــر عــام التعليم الصحي

نسخة كلية الصحة العامة المحترمين/ جامعة القدس /

Annex 7: list of Experts Group for questionnaire validity

| # | Name | Position |
|---|------|----------|
| 1 | Abedalrouf Saleem | Quality Planning Department – Ministry of Health |
| 2 | Asma Imam, Ph.D. | Assistant Professor - Al-Quds University |
| 3 | Firas Zagal | CEO, Dimensions Consulting Co. |
| 4 | Hassan Mahmood | Project Manager " SEHA  Project" |
| 5 | Abdulhamid Qasrawee | Director of Health Information system – Flagship Project |