Deanship of Graduate Studies

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Assessment of nurses knowledge, attitudes, and practices (KAP) regarding of Health Care Acquired Infections (HCAI) In Hebron Hospitals.

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Dedication

I dedicate my dissertation work to my family and friends. First, to my loving parents Sadi and Nadya for their support and help. Second, I dedicate this thesis for my lovely wife Bayan who encouraged my success and supported this attempt. Third, I dedicate this for my sweet daughters, Talya and Sarah. I hope they will understand one day why daddy spent so much time working on the computer , and I plan to have more time with them now on . I thank them for being such great and calm kids. Fourth, I dedicate this thesis to my brother Muhammad as well as my sisters Samar, and Rawwan who never left me and supported me all the time.

Finally, I also dedicate this work to my loyal friends who have supported me throughout the process. I will always appreciate what they have done during the process of preparing this research.

Lo'ai S Abu-Rayyan

Declaration

I declare that this study is the result of my own work research, except where otherwise indicated. It has been submitted for Master degree and not for any higher degree to any other universities.

Signed: .....

Lo’ai Sa’di Abu-Rayyan

Date: 01.11.2020

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Abstract

Background: Nurses are health care professionals who play an important role to protect patients from acquiring infections while hospitalized or while in a health care set up or after discharge. According to World Health Organization WHO, Health Care-Associated or Acquired Infection (HCAI), also referred to as "nosocomial" or "hospital" infection, is an infection occurring for a patient during the process of care in a hospital or other health care facility which was not present or incubated at the time of admission. And the HCAI can be occurred anywhere at any hospital, so all health care providers are at risk for it.

Aim: This study aims to assess nurse's knowledge, attitudes, and practices (KAP) regarding hospitals acquired infections (HCAI) in Hebron hospitals. The study outcomes may help in setting strategies, protocols and plans to decrease these acquired infections.

Methodology: A descriptive cross sectional design with a sample consisted of 409 nurses was conducted at 6 hospitals in Hebron district, three of them were governmental hospital, two were non- governmental and the last one was a private hospital. All nurses in these hospitals were targeted.
Data was collected by using self-administered questionnaire that consisted of 69 items to construct six sections covering social demographics, determinants and health care worker activities, knowledge, attitudes, and practices of nurses toward HCAI, and finally institutional measures to control HCAI.

Findings: in this study, 426 questionnaires were distributed, 409 participants completed the questionnaires, with a response rate of 96%. Most of participants were males; 58.2% (n= 238) while 41.8 % (n=171) were females. The majority of nurses aged between 26 to 30 age group (n= 136, 33.3%). The knowledge score showed a mean of 4.10 with a SD of 0.44. It therefore indicated that nurses had adequate knowledge on infection prevention and control. The attitude score showed a mean of 4.04 with a SD of 0.41. Therefore, it also indicated that nurses had positive attitudes towards infection prevention and control. The practice score was lower than knowledge and attitudes with a mean of 3.60 and SD of 0.45. Furthermore, nurses

‘perception toward their institutional measures was good with regard to infection prevention and control (a mean of 3.39 with a SD of 0.49).

Conclusion: HCAI can be managed considering nursing KAP level, in addition to hospital institutional measurements. The findings of the study concluded that the participants (nurses) had a high level of knowledge, positive attitude and intermittent level of practice. On the other hand, the health institutional measurement affected positively nursing KAP in order to prevent HCAI in Hebron hospitals. So, it is suggested to keep our nurses staff and health care workers up to date with infection prevention precautions measures to enhance their KAP.

تقييم مدى المعرفة والمواقف والممارسات لدى الممرضين والممرضات فيما يتعلق بالعدوى المكتسبة من الرعاية الصحية في مستشفيات الخليل

إعداد: لؤي سعدي حجازي أبو ريان
إشراف: الدكتور حسين الجبارين

ملخص:

الخلفية: الممرضون هم متخصصون في الرعاية الصحية ويلعبون دوراً مهماً لحماية المرضى من الإصابة بالعدوى أثناء دخولهم المستشفى أو أثناء وجودهم في مؤسسة رعاية صحية أو بعد الخروج منها. ووفقًا لمنظمة الصحة العالمية، فإن العدوى المرتبطة بالرعاية الصحية أو المكتسبة من المستشفيات، والتي يشار إليها أيضاً باسم عدوى "المستشفى"، وهي عدوى تحدث للمريض أثناء عملية الرعاية في مستشفى أو داخل مرفق رعاية صحية آخر سواءً كانت غير موجودة أو تم اكتسابها واحتضانها بالجسم عند الدخول. ويمكن أن يتم نقل العدوى في أي مستشفى، لذلك فإن جميع مقدمي الرعاية الصحية معرضون لذلك الخطر.

الهدف: تهدف هذه الدراسة إلى تقييم مدى معرفة الممرضين ومواقفهم وممارساتهم، فيما يتعلق بالعدوى المكتسبة في المستشفيات في مدينة الخليل. وقد تساعد نتيجة الدراسة هذه في وضع الاستراتيجيات والبروتوكولات والخطط لتقليل هذه العدوى المكتسبة.

المنهجية: تصميم مقطعي وصفي يتكون من 409 ممرضين وممرضات وذلك من خلال تعبئة استبانة الدراسة حيث تم إجراؤها في 6 مستشفيات في محافظة الخليل، ثلاثة منها مستشفيات حكومية واثنتان غير حكوميتين وأخرى خاصة، حيث تم استهداف جميع الممرضين والممرضات العاملين في هذه المستشفيات.
تم جمع البيانات باستخدام استبيان يتم الإجابة عليه ذاتياً من قبل المشاركين بحيث يتكون كل استبيان من 69 سؤالاً لبناء ستة أقسام تغطي الصفات الديموغرافية، والمحددات وأنشطة العاملين في مجال الرعاية الصحية، والمعرفة، والمواقف، وممارسات طاقم التمريض تجاه العدوى المشفوية، وأخيراً التدابير المؤسسية للسيطرة على العدوى المشفوية.

النتائج: خلال الدراسة الرئيسية، تم توزيع 426 استبيانًا، أكمل منها 409 مشاركًا الاستبيانات، بمعدل استجابة 96٪. كان معظم المشاركين من الذكور بنسبة 58.2٪ (العدد = 238) بينما 41.8٪ (العدد = 171) من الاناث. غالبية الممرضين تتراوح أعمارهم بين 30 و36 سنة بمجموع 136 ممرض وذلك يشكل (33.3٪).

تظهر درجة المعرفة بمتوسط 4.10 مع 0.44 انحراف معياري، وذلك يشير إلى أن الممرضين لديهم معرفة كافية بالوقاية من العدوى ومكافحتها. وكذلك تظهر درجة المواقف بمتوسط 4.04 مع 0.41 انحراف معياري، وذلك يشير إلى أن الممرضين لديهم مواقف إيجابية تجاه الوقاية من العدوى ومكافحتها. و تظهر درجة الممارسة بمتوسط 3.60 مع 0.45 انحراف معياري، ووجدت الدراسة أن تصور الممرضات تجاه تدابيرهم المؤسسية كان جيداً فيما يتعلق بالوقاية من العدوى ومكافحتها (بمتوسط 3.39 مع انحراف معياري0.49).

الخلاصة: يمكننا الإدارة والتحكم بالعدوى المشفوية اعتماداً على مستوى المعرفة والسلوك والممارسات التمريضية، بالإضافة إلى الإجراءات المؤسسية في المستشفى. بناءً على نتيجة هذه الدراسة، كان لدى الممرضين والممرضات المشاركين مستوى عالٍ من المعرفة، والسلوك الإيجابي، ولكن جاء بمستوى أقل الممارسات الشخصية التي يتخذونها لمكافحة العدوى.

ومن ناحية أخرى، تؤثر إجراءات المؤسسات الصحية بشكل إيجابي على التمريض والممارسات المهنية والتمريضية من أجل منع حدوث العدوى المشفوية في مستشفيات الخليل. لذلك أقترح إبقاء طاقم التمريض والعاملين في مجال الرعاية الصحية على اطلاع دائم باحتياطات الوقاية من العدوى من خلال تعزيز المعرفة والممارسات والمهارات

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1. Chapter One: Introduction

1.1 Introduction

Nurses are health care professionals who play an important role to protect patients from acquiring infections while hospitalized or while in a health care set up or after discharge. According to World Health Organization (WHO) Nursing encompasses autonomous and collaborative care of individuals of all ages, families, groups and communities, sick or well and in all settings. It includes the promotion of health, the prevention of illness, and the care of ill, disabled and dying people. Nursing is the largest, the most diverse, and one of the most respected of all health care professions. According to the last report of the Palestinian Ministry of Health in 2018, there are 7879 nurses in West Bank and 3580 nurses in Gaza strip(MOH 2018).

According to WHO, Health Care-Associated or Acquired Infection (HCAI), also referred to as "nosocomial" or "hospital" infection, is an infection occurring for a patient during the process of care in a hospital or other health care facility which was not present or incubated at the time of admission. HCAI can affect patients in any type of setting where they receive care and can also appear after discharge (WHO, 2020)

Patients and health care team are susceptible to catch infections inside their hospitals due to several reasons. Each year, 2.5 million health care-acquired infections (HAIs) occur in the United States alone, of which 30,000 result in the primary cause of death and another 70,000 indirectly result in death (Winnable & Final, 2015).According to the Center for Disease Control and Prevention (CDC), costs associated with these infections have been estimated to be $4.5 million per year(Guinean, 2005). More than 80% of HAIs are caused by four types of infections: urinary tract infections, surgical site infections, bloodstream infections, and pneumonia (Gasink & Lautenbach, 2008).

Among the confirmed patients, the proportions of nosocomial infections were 44.0% COVID-19, 36.0% for, SARS and 56.0% MERS. The medical staff and other hospital-acquired infections accounted for 33.0% and 2.0% of COVID-19 cases, 37.0% and 24.0% of SARS cases, and 19.0% and 36.0% of MERS cases, respectively. Nurses and doctors were the most affected among the infected medical staff(Zhou et al., 2020).

The Palestinian Ministry of Health (MOH) adopts mainly the WHO protocols and polices for infections control in Palestinian healthcare settings like the policy of dealing with a patient infected H1N1, hand washing policy, policy of isolating immune compromised patients and other polices (WHO guidelines, 201 -1).However, there is a lack of assessment of nurses 'knowledge, attitude, and practice regarding health care acquired infection (HCAI) in Palestinian hospitals, especially at Hebron areas.

Coronavirus disease which is also known as COVID-19 is a rapidly spreading pandemic caused by a novel human coronavirus (SARS-COV-2). COVID-19 was first reported in December 2019 among patients with viral pneumonia symptoms in Wuhan, China (Olum et al., 2020). Healthcare workers (HCWs) are at the frontline to face COVID-19 outbreak and they are exposed to themselves to risk of infection with virus pathogen exposure, working for long hours in medical field , psychological distress related to fear from Corona transmission, fatigue, family pressure, occupational burnout and stigma, and physical violence (Olum et al., 2020). So, poor understanding of this COVID-19 or any infectious disease among HCWs can result in delayed identification and treatment leading to rapid spread of infectious disease and its outbreak. Over 100 health workers have lost their lives by COVID−19at Uganda, a tragedy to the world and a barrier to fight against the disease. Guidelines and online courses were developed by WHO, CDC, and various governmental organizations in different countries for healthcare workers to enhance their knowledge and prevention strategies (Olum et al., 2020).

The Palestinian Ministry of Health and most of Palestinian hospitals have adopted the WHO's protocols of infection control in order to be used inside their clinical departments. For instance, for the personal protective equipment's (PPEs), WHO describe the rational use of PPEs in health care, community settings, and during the handling of home purchases. PPEs includes gloves, face masks, goggles or a face shield, and gowns, as well as for specific procedures, and WHO recommended to useN95 mask. Further information are provided about appropriate time and way to use it (WHO- Ppe, 2020).

This study aims to investigate the influence of nursing demographics variables and institutional measures on nurses' knowledge, attitudes, and practices (KAP) regarding of health care acquired infections (HCAI) in Hebron hospitals.

Although HCAI is the most common complication or adverse effects which may happen in health care setting during hospitalization, its true global burden remains unknown because of the difficulty in collecting accurate data because most countries lack surveillance systems for HCAI. On other hand, those that do have them struggle with the complexity and the lack of uniformity of criteria for diagnosing it. Every day, HCAI results in prolonged hospitalization for patient, long-term complaining and suffering, long term antibiotics treatment which lead to increased resistance of microorganisms to antimicrobials and developing multidrug resistance bacteria (WHO, 2020).

1.2 Justification

There is a lack of data and proper assessment tool to assess nurses' knowledge, attitudes, and practice toward nursing infection control activities in Palestinian hospitals. In addition, the lack of information leads to difficult monitoring and evaluating of KAP in order to improve infection control performance, policies, and protocols in Palestinian hospitals especially in West Bank

In Palestine, there has been a significant medical progress in the medical field, with the aim of increasing the life span and prevent mortality and morbidity of patients. For example, a study in 2005 of Nosocomial infection caused by methicillin-resistant Staphylococcus aureus in Palestine showed that the prevalence of methicillin resistance among S. aureus isolates was 8.7% (Adwan, Adwan, et al., 2005).

However, no study investigated the nursing staff KAP and institutional measures towards these infections. The recent infections by Corona virus among nurses is a good example of the importance of conducting this study.

So there are needs for more study to assess health care system in Palestine.

1.3 Problem statement

HCAI is a major public health problem worldwide as well as in Palestine, and infections are one of the most important causes of mortality and morbidity in hospitals. Studies conducted in different regions over the world found that in North America and Europe 5%–10% of all hospitalizations result in nosocomial infections, while Latin America, Sub-Saharan Africa and Asia show more than 40% hospitalizations with nosocomial infections (Khan et al., 2015). On the other hand, the incidence of HAI was 22.6% and 28.7/1000 person-days (pds). The incidence of pneumonia (PN) was 8.0%, bloodstream infections (BSIs) 7.2% and urinary tract infections (UTIs) 3.7%. The incidence per 1000 pds was as follows: PN 10.2, BSIs 9.2 and UTIs 4.7. Mortality (directly and indirectly) associated with HAI was 10.8% and was related to the presence of PN or primary BSIs. HAIs were usually (69.2%) caused by Gram-negative bacteria; Klebsiella, and non-fermenting Gram-negative rods demonstrated very high antibiotic resistance (Walaszek et al., 2018). Patients admitted to hospitals and hospitals employees are at risk of acquiring infection from hospitals. The Knowledge, Attitudes, and Practices (KAP) of nurses who are directly and continuously in contact with patients are significantly affected by their demographic characteristics and institutional measures in preventing cross infections and decrease morbidity. This study assesses nurse's demographic characteristics and institutional measures at Hebron hospitals that impact on nurse's knowledge, attitudes, and practices regarding of health care acquired infections (HCAI) in Hebron hospitals.

Regarding patient's safety, the World Health Organization estimates that there are hundreds of millions of patient can influenced by health care-associated infections (HCAI) over the world each year, leading to a significant impact on morbidity, mortality, and financial losses for health systems(World Health Organization, 2011).For every 100 hospitalized patients at any periodic time , seven patients in developed and ten patients in developing countries get at least one type of health care-associated infection. The average burden of infection associated with health care is significantly high in low- and middle-income countries that do not have sufficient resources or financial support for health sector. On other hand, it's significantly low in high-income countries, in particular in patients admitted to intensive care and in neonates departments.

Urinary tract infection which is the most frequent health care-associated infection in high-income countries, and surgical site infection (SSI) which is the leading infection in settings with limited resources, affecting up to 1 from 3 of operated patients; this is up to nine times higher than in developed countries. In high-income countries, in intensive care units (ICU) by the average 30% of patients are affected by at least one type of health care-associated infection. In low- and middle-income countries the frequency of ICU-acquired infection is at least two to three fold higher than in high-income countries. Hover Newborns, especially premature are at higher risk of acquiring health care-associated infection in developing countries, with a deferent infection rates incidence three to 20 times higher than in high-income countries(Shirol et al., 2014).

There are an increased risk of nosocomial infections most of the time associated with admissions to intensive care units (ICUs) over the world. There is no adequate data or studies have been reported for the incidence, prevalence, and determinants of these infections in patients admitted to ICUs in the Gaza Strip. For instance, there is a retrospective systematic study about nosocomial infection in patients admitted to an intensive care unit at Al-Shifa Hospital in the Gaza Strip, in Palestine from Jan 1, 2006, to June 30, 2009. The sample was systematically selected from medical file of every tenth patient admitted to the ICU from the hospital's archive. The study mean age of 206 patients' files which were selected was 36 years who were admitted to the ICU, and 128 (62%) were men. The mean period of stay at the ICU was 6·2 days. Whereas 27% of patients stayed in the ICU for up to 1 day,21% for 2–3 days, 35% for 4–7 days, 9% for 8–14 days and the remaining8% of patients still for more than 2 weeks. It was found that50 (24%) patients had nosocomial infections. 28of them had (56%) pneumonia, 7 (14%) wound infections, seven (14%) multiple causes, three (6%) bacteremia, three (6%) undetermined, and infections related to the urinary tract UTI is 2 patient which form (4%) of all patents. The first organism causes the health acquired or nosocomial infections were pseudomonas in (30%) patients, klebsiella (16%), Acinetobacter (12%), Escherichia coli (10%), staphylococci (4%), Enterococcus (2%), and more than one microorganism in six (12%). And the causative microorganisms were not diagnosed specifically for seven (14%) patients. The study concluded that 29 of 36 patients who stayed in the ICU for more than 1 week had nosocomial infections

compared with 15 of 72 who stayed from 4 days to 1 week, and 6 of 98 who stayed for up to 3 days.

Furthermore, each year, about 7 million hospitalized patients acquire infections through being treated for other medical or conditions in hospital settings. Nurse staffing has been considered as the most implicated in the transmission of microorganisms and spread of infection within hospitals, yet few evidence is available to explain this association. Study about nurse staffing, burnout, and health care–associated infection examined how the nurses contribute or prevent occurrence of urinary tract and surgical site infection, these are most infections reported and more likely to be acquired on any nursing department within a hospital. The study showed that there was a significant association between patient-to-nurse ratio and urinary tract infection (0.86; $P = .02$) and surgical site infection (0.93; $P = .04$). Also, the study concluded that according to the association between nurse staffing and health care–associated infections, reducing burnout and loads in registered nurses is a better promising strategy which help to control infections and decrease risk of morbidity and mortally within hospitals (Vaccarino, 2008).

The risk of nosocomial infections for these admitted cases increased according its diagnosis, 13 of 68 patients with an internal medical diagnosis and treatment, 12 of 64 admitted for post-operative care, 10 of 50 admitted for post-neurosurgical care, 5 patents of 13 admitted after cardiopulmonary arrest and resuscitation successfully, and ten of 11 with multiple trauma developed nosocomial infections. The risk of death was higher in the 50 patients who acquired nosocomial infections compared with 156 patients who did not (42% vs 21%; attributable risk percentage 50%, 95% CI 17–83; p=0·013). Due to The high frequency and attributable risk, this study indicated the need for additional preventive and control measures for infections and health care worker should trained more about updated infection control protocols in the ICUs of all hospitals in the Gaza Strip(Ashour& El-Nakhal, 2012).

1.4 Aim of the Study

This study aims to assess nurse's knowledge, attitudes, and practice (KAP), and institutional prevention measures regarding hospitals acquired infections (HCAI) in Hebron hospitals.

1.5 Objectives

1. To describe hospitals' preventive measures to control (HCAI) at Hebron hospitals.
2. To assess nurses' knowledge, attitudes, and practices towards (HCAI) in Hebron hospitals.
3. To determine the relationship between the various nurses' socio-demographic characteristics and KAP.
4. To determine the relationship between hospitals' measures and KAP.
5. To assess the relationship between nurses' socio-demographic characteristics (especially type of hospital, training courses, presence of infection control committee, meetings) and hospitals' institutional measures.

1.6 Research question

1. What are the main measures taken by hospitals at Hebron to control HCAI??
2. What is the level of nurses' knowledge, attitudes, and practices regarding (HCAI) in Hebron hospitals?
3. What is the relationship between various nurses' socio-demographic characteristics and KAP?
4. What is the relationship between hospitals' measures and nurses KAP?
5. What is the relationship between nurses' socio-demographic characteristics (especially type of hospital, training courses, presence of infection control committee, meetings) and hospitals' institutional measures?

1.7 Ethical consideration

Ethical approvals were obtained from the Public Health Faculty of Al-Quads University review board to conduct this research.

2. Chapter Two: Literature Review

2.1Introduction

In this chapter, an overview of previous literature about health care acquired infection and in particular that related to perception of nurses toward knowledge, attitudes, institutional practices (KAP), and their individual precautionary performance for infection prevention and control is investigated. Due to limited studies and researches conducted in Palestine on this topic, I have reviewed the literature from other countries.

Health-acquired conditions (HACs) are infection that originate from a stay in a clinical or hospital facility. Hospital-acquired infections are also known as nosocomial infections. Health-care-associated infection (HAI) is a major global safety concern for both patients and health-care professionals. HAI is defined as an infection occurring in a patient during the process of care in a hospital or other health-care facility that was not manifest or incubating at the time of admission (Nejad et al., 2011).

2.2 Local and regional studies

There are no published studies in Palestine hospitals pertaining directly to assess the attitude of nurses regarding health care acquired infections (HCAI) depends on any score or scale. However, there is a study investigated knowledge and practice of nursing staff towards infection control measures in the Palestinian hospitals which was conducted on January2015. The study revealed that, approximately half (53.9%) of the studied sample had fair knowledge level (<80%). However, the majority (91.1%) of the studied sample had good practice (>80%). No significant statistical differences were found between mean knowledge scores towards age, years of experience, and training course (f=2.263, 1.607, 0.210) respectively at $p < 0.05$(0.082, 0.188, 0.647) respectively. The recommendations were to update knowledge and practice of nurses through continuing in-service educational programs; emphasizing the importance of following latest evidence-based practices of infection control in continuing education /training program; providing training programs for newly nurses about infection control and at regular intervals; and a replication of this study using observation checklist that should be done to assess the level of practice (Fashafsheh et al., 2015).

Unpublished thesis at Al-Quads University about effectiveness in improving hand hygiene compliance level among health care workers and food suppliers at Caritas Baby Hospital concluded that hand hygiene is the cornerstone of infection prevention. Hand hygiene compliance among health care workers and food suppliers was improved positively from 72.62% at baseline to 95.72% post WHO multimodal intervention (S. Emaya, 2015).

Another study that assessed infection prevention and control practices at operating rooms in nongovernmental organizations hospitals at Gaza governorates (Al-Quads University) thesis showed that the majority of HCWs knew about IPC practices and its role in reducing nosocomial infections. Also the majority of HCWs had good attitudes towards IPC practices (Elmadhoun, 2012).

Also, a census study of evaluation of the environmental infection control at intensive care unit in Gaza governorates indicated that all ICU HCPs in this study had positive attitude toward EIC except in some items which need to improve their perception. For example, 64.66% of them doubted about removed of syringes from used needles before disposal (t-value 1.291 less than 2.0, P-value 0.201 more than 0.05) (Khadoura, 2013).

The Standard precautions are the basic component for infection control precautions which are to be used, as a level of precautions, standards, protocol and recommended when delivering the care to all patients, its effect on their presumed infection status either increase or decrease cross infections . So nurses should have sufficient sound knowledge and compliance with updated standard precaution. A cross sectional study was conducted to assess the level of knowledge and compliance of standard precautions among the nurses in the southern hospitals of Palestine. This study found that 38.2% of participants had fair knowledge, and 37.8% had good knowledge of standard precautions. However, approximately 24.0%of the studied sample had poor knowledge level. According to their compliance, 52.9% of the total participants had fair level, 45.6% had good level and only 1.5%had poor level. The study concluded that the staff nurses participated in this study have fair level for both knowledge and compliance regarding standard precautions. However, one quarter still had poor

knowledge level. So the study Recommendations to continue gave him Updating educational program about knowledge and compliance and providing training programs for newly nurses about standard precaution and at regular intervals (Ayed, 2015).

Risk factors for infection include poor nursing care for patients, and miss use of infection control strategies and protocols within hospitals, so there is a need to enhance the level of awareness toward infection control strategies, and to improve the practice techniques on infection control standards. A descriptive design study was conducted including 95 nurses' students who were randomly selected in order to assess the level of knowledge, attitude, and practice of nursing students' toward using infection control strategies in hospitals. The study found that there were no significant relationship between nursing students knowledge towards infection control strategies used in hospital according to their gender, academic year, and wards that have been trained in. Although there was a significant relationship between students' awareness and practice according to gender, there was no significant relationship between awareness and practice according to level of education and wards being trained in. In conclusion there must be more focus on infection control topics and strategies in the university curriculum, and conduct workshops in order to enhance nursing students' knowledge, attitude and practice towards infection control in health care institutions(Rn et al., 2019).

In 2018 there is a study published in Palestinian Medical and Pharmaceutical Journal (PMPJ) about Evaluation of Compliance to Infection Control Protocols in the Governmental Hospitals in the West Bank/Palestine. Compliance with infection control protocols (ICP) can decrease rate and incidence of nosocomial infections. This is a descriptive cross-sectional study using a self-administered questionnaire of 587 doctors and nurses was conducted to evaluate compliance of the hospitals' administration, doctors and nurses to ICP in the governmental hospitals in the West Bank. Just 44.6% of participant said that there is a copy and work on ICP in their department and 38.0% said that they had educational courses related to infection control. The nurses were more likely to receive educational courses; 47.4% nurses versus 24.5% doctors. Among respondents, 72.1% said they always wash their hands

after the patients examining. However, only 42.6% said that they always wear gloves when they examine the patients. The limitations to compliance for ICP according to this study due to absence of enough resources is 55.0%, absence of sufficient training programs 49.6%, absence of clear protocols for health care workers 44.1% and large number of patients and over load 44.0%. The study finds that knowledge regarding these protocols is not enough, and Compliance of healthcare providers with ICP is very low. So the study recommended to have standardized Palestinian ICP can be applied in health care setting, and education and training programs are highly recommended to enhance health care worker compliance and knowledge to minimize the risk of nosocomial infection(Medical, 2018).

2.3Arab world countries studies

There are some researches on Arab world countries, such as at Lebanese University on September 2017 about nurses' awareness and role of infection control measures, and effect on patient and family education (Hammoud et al., 2017).This study showed a high level of infection control awareness (81.57 %) among Lebanese nurses, and showed that Lebanese hospitals train their nurses on IC topics (99.1 % of nurses were trained). The study concluded that nurses who had a high level of awareness in infection control, educate their patients and family members on these measures more than nurses with low awareness.

Another Arabic study was a descriptive study that aimed to explore Jordanian nursing students' knowledge of, attitudes towards, and compliance with infection control precautions (Sarani et al., 2015).The study found that the participant had inadequate knowledge (M = 49.64%), with positive attitudes (M = 89.8%), and moderate compliance (M = 75.91%) with infection control precautions. Participants' positive attitudes confirmed that nursing schools are the right place to start and focus the efforts that aim to improve their knowledge and compliance with infection control precautions within the healthcare settings (Sarani et al., 2015).

The last development and reemergence of infectious diseases lead to encourage knowledge and practice of standard infection control precautions in developing countries more than ever. For instance, a Jordanian study conducted to investigate the effectiveness of using an online education module on enhancing knowledge and compliance with infection control Standard Precautions among undergraduate nursing students. The pretest findings show that there was low levels of knowledge and compliance with Standard Precaution practices and relatively few (15.2% and 27% respectively). But there were significant differences in the mean scores of knowledge and compliance between pretest and posttest. So the study recommends to use the online instruction since it offers a consistent and effective method of teaching standard precautions of Infection control into nursing education(Hassan, 2018).

Standard isolation precautions (SIPs) are clinical practice policies and guidelines for controlling healthcare associated infections (HCAIs) and decrease the risk of infection within health care setting. A cross-sectional survey was conducted from 5th January to 16th February 2016 at Prince Sattam Bin Abdulaziz University in Al-Kharj Governorate, Saudi Arabia aim to evaluate healthcare students' knowledge and compliance with SIPs. The study showed that about 353 students, the overall means of knowledge and compliance with SIPs were included within highest ranges. This means that the study sample agreed with all correct answers of knowledge questions and always complied with all recommended statements of compliance. Females were found to have higher mean scores in knowledge and compliance, with statistically significant differences ($P < 0.05$). According to the results of study analysis of variance, there were statistically significant differences in mean scores of knowledge and compliance between different specialties and academic levels(Julia Nicole Simac et al., 2017).

Saudi Arabia is considered as the center of MERS-CoV. Since 2012, a total of 1844 cases of MERS-CoV have been reported. This cross sectional study about Knowledge and attitudes towards Middle East respiratory syndrome-coronavirus (MERS-CoV) among health care workers in south-western Saudi Arabia was conducted in primary health care centers and hospitals at Najran consist of 870 participants filled A questionnaire containing knowledge and attitude questions. The aim of this study is to

identify the knowledge and attitude of HCWs toward MERS-CoV in south-western Saudi Arabia. The study finds Overall, >80% of HCWs were aware about MERS-CoV etiology, mode of transmission, risk factors, and signs and symptoms. Knowledge scores revealed 51% of participants had sufficient knowledge. Physicians and nurses had significantly better knowledge compared with other HCWs (P = 0.001). More than 70% of HCWs participated in this research had a positive attitude regarding MERS-CoV. The study concluded that HCWs in Najran had a high and a good level of knowledge and positive attitude regarding MERS-CoV disease. There was a noticeable difference in knowledge level between different professions. Still needed a Periodic educational program and internship needed especially for how's non-physician and non-nursing professions (Asaad et al., 2020).

This study about Perception and Barriers Regarding Infection Control Measures among Healthcare Workers in Minia City, Egypt. A descriptive cross-sectional study Conducted on 350 HCWs by a questionnaire Aimed to assess perception of healthcare workers (HCWs) toward infection control measures and to identify the major barriers that may hinder the proper infection control practice and to compare perception of HCWs toward Infection control measures between Minia University Hospital and Minia General Hospital. The study finds that about 85% of HCWs in Minia University Hospital compared with 82% in Minia General Hospital had a positive perception toward Standard precautions (SPs). Knowledge score was the only significant predictors of perception of HCWs toward infection control. Increase in knowledge score is associated with significantly 13% lower odds to have negative perception; the multivariable-adjusted odds ratio (95% confidence intervals) was 0.87 (0.81-0.95). The most barrier of practice of SPs was absence of sufficient material gloves and gowns. And study concluded that HCWs explain positive perception toward infection control and SPs measures (Refeai et al., 2020).

Staff nurses are exposed to many blood product and other body fluids during the course of their day to day activities especially in Intensive Care Unit. A cross-sectional study using self-administered questionnaire aim to assess the level of nurse's knowledge, attitudes and practices of standard precaution in Intensive Care unit, in Middle East Hospital. The study shows Female nurses accounted of respondents 66.7% while male

nurses form33.3% of the nursing workforce in the study. 53% of the respondents not having any training or experience in infection control practices, while the other 47% respondents received their training or basic exposure in infection control practices. The study Conclusion 77% of the respondents practice good practices about standard precaution. The knowledge, attitude and compliance among ICU nurses in the middle-east hospital towards standard precaution was sufficient and adequate (Mohd-Nor & Bit-Lian, 2019).

2.4 International studies

There are many epidemiological studies and researches were carried out globally and focused not only on assessing nursing attitudes but also assessing knowledge and practice of nursing regarding health care acquired infection.

A thesis about knowledge, attitudes, and practice of nurses in infection control within a therapy hospital in Zambia 2017showed the nurses being knowledgeable (mean score 83%) and having a positive attitude (mean score 81%) towards infection prevention and control, on the other hand, the practices were very poor (mean score 48.8%) (Shimaponda-Mataa et al., 2016). However, we assume at our study that if nurses are knowledgeable and have a positive attitude towards infection prevention and control, then the practices of nurses are expected to be good.

According to another study about knowledge, attitude and practice towards infection control measures amongst healthcare workers in a medical teaching hospital of Calicut District, Kerala, India on June 2015,there was a need for improvement in the knowledge, attitude, and practice of infection control measures among healthcare workers for both self and patient's protection (Sha, 2015).All healthcare workers were aware about the indication for using masks and gloves while handling patients, while only 77.1% were using them. This study also found that only 61.8% washed their hands after attending every patient, 94.3% cleaned the area with a sterile swab before giving injections, and only 35.7% of the labs/wards/operation theatres had three colored bags.

In a study of prevention and treatment of health care–acquired infections from the medical clinic of north American in 2018, the investigator reported that infections are the most common adverse events encountered in health care affecting approximately 2 million people, resulting in 90,000 deaths, and costing in excess of $4.5 billion each year in the United State(Collins, 1991).Unfortunately, the risk of acquiring a health care–associated infection (HAI) is rising. An estimated 5% to 10% of patients admitted to acute care hospitals would become infected. This indicates the importance of studying the transmission of infection in Palestinian hospitals in order to take the necessary measures to reduce infection and reduce the expenses in this area.

Education and training of healthcare workers (HCWs) in the theory and practice of IPC is widely regarded as a pivotal measure to reduce the risk of HAI. IPC education provides HCWs with a knowledge base and insight that act as a driving force behind future activities, whereas IPC training is task-orientated within a specific working milieu and helps HCWs to acquire skills to complete clinical procedures to set standards of care. So, the new and old employee should take a routine update course about infection control protocol and policies.

Numerous factors are associated with high risk of HAI. The factors that can minimize the risk of HAI include the systematic treatment of patients, avoiding prolonged hospitalization, the use of antibiotics, the use of suction catheters, hand washing by health care personnel, and the use of sterilization techniques in therapeutic procedures (Collins, 1991)

The results of a study conducted at the teaching hospitals affiliated to Zabol University of Medical Sciences (2014)indicated a low level of awareness among the personnel about hospital infection, but it suggested to provide training sessions on the prevention and control of HAI to increase the awareness of personnel and hold practical courses for practicing these principles (Sarani et al., 2015).

The prevalence of healthcare associated infections among adult inpatients at nineteen large Australian acute-care public hospitals: a point prevalence survey

Australia does not have a national surveillance program about healthcare associated infection (HAI). Only one HAI study has been conducted in 1984. A cross sectional study was conducted in a sample of large acute care hospitals, aim to estimate the burden of healthcare associated infection (HAI) in acute adult inpatients in Australia. The study shows a total of 2767 patients from 19 hospitals were included in the study. The median age of patients was 67, and 52.9% of the sample were male. 10.3% of the patients had a multidrug resistant MDR organism. There were 363 HAIs present in 273 patients. The prevalence of patients with a HAI was 9.9% Hospital prevalence rates ranged from 5.7% to 17.0%. The most common cause of HAIs were surgical site infection SSI, pneumonia and urinary tract infection. The study concluded that the prevalence rate is higher than the previous Australian study1984. Regular, large scale HAI PPS should be undertaken to generate national HAI data to inform and drive national interventions (Refeai et al., 2020).

A cross-sectional survey was conducted from 4th to 8th February, 2020 to assess healthcare workers' (HCWs) knowledge, practices, and attitudes regarding coronavirus disease 2019 (COVID-19. The study involving a 1357 HCWs across 10 hospitals in Henan, China. It shows that 89% of HCWs had precautions measures of COVID-19, more than 85% feared self-infection with the virus, and 89.7% followed correct practices regarding COVID-19. In addition to level of staff knowledge there are some risk factors influenced HCWs' attitudes and practice concerning COVID19 including work experience and job category. Protective Measures must be applied in order to protect HCWs from risks linked to job category, work experience, working hours, educational attainment, and frontline HCWs (Zhang et al., 2020).

2.5 Knowledge in infection prevention and control to minimize HCAI

According to oxford dictionary knowledge defined as Facts, data, information, science and skills acquired by a person through experience from life's and work fields, or education from university(oxford lexico, 2020).This study was conducted among nurses in a university teaching hospital in Ajman, United Arab Emirates to assess

nurse's awareness and knowledge of standard precautions. Using self-administered questionnaire: 101 nurses participated. Overall 97% of participant were celebrated with the concept of standard precautions. 61.2% of these nurses believed that the blood and body fluids of all patients are potentially infectious irrespective of their diagnostic status, while 27.6% thought only diagnosed patients and 11.2% only suspected cases are potentially infectious. Less than half agreed that standard precautions aimed to protect both health care workers as well as patients (45.9%). The study concludes a need to implement a program to improve health care worker knowledge on standard precautions to prevent infection (Sreedharan et al., 2011).

2.5.1Adequate knowledge in infection prevention and control

Adequate or strong knowledge is considered as power for nurses and well play an important role to prevent health care acquired infection and to minimize its risk. Infection control precautions are necessary to reduce occurrence of hospital-associated infections, so the descriptive cross-sectional study was conducted for 100 nurses working in the private hospitals located in the capital city of Yemen. They answered a 45-item questionnaire to assess knowledge and practices regarding nosocomial infection control measures. The collected data show Most of the nurses (87%) had a fair level of knowledge, while only 4% of them had a good level of knowledge about preventive measures of nosocomial infections practices. So this study Conclusion depends on the gaps in knowledge and practices regarding NI control measures indicate the need to establish a related health care policy regarding NIs and implement a regular training program to upgrade and refresh the nurses' knowledge and practices regarding NI control measures to enhance the level of infection prevention and protection (Alrubaiee et al., 2017).

Assessing knowledge, attitudes and sources of information among nursing students towards infection control and standard precautions, Ghalya and Ibrahim (2014:249-260), results revealed that the overall knowledge scores for nursing students towards infection control and standard precautions were acceptable, students achieved the highest score in hand hygiene domain and lowest score in sharps disposal and sharps injuries. The main source of information for students was the curriculum. This study was conducted to assess the knowledge of infection control practices among intensive

care nurses in a tertiary care hospital, with a total of 100 nurses in the intensive care units by using a questionnaire with 40 multiple choice questions. The study showed that the knowledge and awareness regarding different infection control practices were excellent (>90% positive responses) in 5% of the nursing professionals, good (80—90% positive responses) in 37%, average (70—80% positive responses) in 40% and below average (< 70% positive responses) in 18 %. So this study concludes that the nurse's knowledge was fairly good, and there is still a wide scope of improvement with regular educational programs and in-house training (Sodhi et al., 2013).

2.5.2 Inadequate knowledge of infection prevention and control

Knowledge deficit in the medical field about infection control stander's lead to increase `probability of pathogen transmission in the health care setting. And a lack of knowledge towards infection control practices among health care workers lead to decreases compliance and applications of these practices. A cross-sectional, interview-based survey from Weill Cornell Medical College, Qatar a study conducted Knowledge, awareness, and attitude regarding infection prevention and control among medical students who can be exposed to serious health care-associated infections, if they are not following infection prevention and control (IPC) measures. There is limited information regarding the knowledge, awareness, and practices of medical students regarding IPC and the educational approaches used to teach them these practices. This study aims to evaluate the knowledge, awareness, and attitude of medical students toward IPC guidelines, and the learning approaches to help improve their knowledge. The study finds that 85.48% of respondent had sufficient knowledge about hand hygiene and practiced it on a routine basis, but only 33.87% knew the duration of the hand hygiene procedure. So, the study found that the Knowledge, attitude, and awareness among those students in Qatar had inadequate knowledge. So it's better to do training programs target for newly graduated medical student or the training has to be included in the graduate medical schedules to support them to adopt and adhere to IPC guidelines (Shamseldin Elshafie & Ibrahim, 2016).

2.6 Attitude towards infection prevention and control

According to the Cambridge dictionary, attitude defined as a way of behaving, feeling or opinion about something or someone. In this case, attitude towards infection prevention and control (cambridge dictionary , 2020). An interview study conducted about Attitudes towards the Infection Prevention and Control Nurse Aim to investigate the experiences and learning needs of nursing students in relation in infection prevention field, and to consider the views of both nursing students and mentors regarding Infection Control and Prevention. Using a qualitative study design, data were obtained through interviews with 32 nurse mentors and 31 nursing students. Interviews were recorded, transcribed and analyzed using framework analysis. So the study recommended to identify areas where attitudes may affect both clinical practice and the education of nursing students in clinical placements (Ward, 2012).

2.6.1 Negative attitude towards infection prevention and control

The negative attitude towards infection prevention and control leads to transmission microorganism and spread infection with health care centers. This study conducted to investigate perceptions and attitude to prescribe Pre-Exposure Prophylaxis (PrEP) among HIV specialists, using a questionnaire developed through literature review which was distributed to a sample of HIV specialists during educational courses in February, May 2012. Respondent was categorized to have a positive or negative attitude according to their readiness to prescribe PrEP. The study assessed relations between a different attitude regarding PrEP prescription and selected characteristics by univariate and multivariate regression analysis. So, the study shows a negative attitude regarding PrEP within participant , significantly related to shortage of provision of information on, and prescription of, antiretroviral post-exposure prophylaxis; participant with a negative attitude confirms behavioral interventions to be more effective than PrEP and were more concerned about toxicity. So, the study concluded that despite conflicting attitudes appear, most specialists seem to be willing, with guidance from standard bodies, to promote PrEP within multiple prevention strategies among vulnerable populations and More scientific evidence towards effectiveness could cope with resistance (Puro et al., 2013).

2.6.2 Positive attitude towards infection prevention and control

Positive attitude regarding infection control and prevention can reduce the chance of pathogen transmissions and Hospital acquired infections. Conducting a study in India to assess Knowledge attitude and practice towards infection control measures amongst healthcare workers in a medical teaching hospital. The Healthcare should improve organization of work, implement standard precautions and dispose biomedical waste correctly to prevent field exposure and decrease risk of infections. A cross-sectional study was conducted of the 120 participants, all healthcare workers were aware about the rational for using gloves and masks while handling patients, whereas only 77.1% were using them. We found that only 61.8% washed their hands after contact every patient immediately, 94.3% cleaned the area with a sterile swab before giving injections. Its appear that 11.7% of the health care workers have already exposed to infectious blood samples and 19.2% are still not immunized against Hepatitis B disease. So, the study concluded a recommendation that health care workers need to improve and enhance their Knowledge, attitude and practice of infection control measures either for self and patient's protection. And they should get themselves Hepatitis B immunization and reporting any accidental samples to the infection control committee (Sha, 2015).

2.7 Practices of nurses in infection prevention and control

According to the medical dictionary practice defined as usual or customary action or proceeding aimedto do or perform (something) repeatedlyin order to acquire or Polish Skill (Medical dictionary 2011). A study in April 2017 Neutropenia-associated infections can prolong hospitalization, increase re-admission, mortality and morbidity rates, this descriptive study of 51 staff nurses conducted at adult oncology department of a university hospital in Turkey, aim to determine nurses' knowledge and infection control care practices in neutropenic patients. The researcher observed nurses three times for infection control care practices. And data collection form included demographic data, knowledge questions about neutropenia, and infection control practices. The study show that all three observations hand hygiene adherence was found inadequate during medication preparation, drug administration and vital signs assessment.

Unfortunately sterility invalidated in almost all preparation of parenteral medications. Finally, the study concluded nurses' knowledge about neutropenia and care of neutropenic patient was found above average and their practices toward infection control care were found inadequate (Tarakcioglu Celik & Korkmaz, 2017).

Research about nurses' knowledge and practice regarding the prevention of SSIs. Nurses knowledge and practice about surgical site infections (SSIs) still insufficient in Ethiopia (Woldegioris et al., 2019).A sample of 423 nurses who work in referral hospitals randomly selected to participate in a questionnaire survey. The main objective of the study was to assess knowledge, practice, and associated factors of nurses towards the prevention of SSIs. The study finds more than half of the nurses who participated in the study had incompetent knowledge about SSIs prevention. Furthermore, more than half of them practicing inappropriately. The most important factors that associated with this result include lack of training on evidence based guidelines to how care with these cases and demographic variables. So, the researcher recommended to train the nurses with the up-to-date SSIs guidelines (Woldegioris et al., 2019).

2.7.1 Good practices in infection prevention and control

Hand hygiene is very important to prevent cross infection within health care setting. The Guideline for Hand Hygiene in Health-Care Settings provides health-care workers (HCWs) with a survey of data regarding hand washing and hand antisepsis uses in health-care settings(Boyce & Pittet, 2002).This study conducted in 2002 about Guideline for Hand Hygiene in Health-Care Settings. Recommendations of the Healthcare Infection Control Practices Advisory Committee and the Hand Hygiene Task Force. The aim of this study is to review studies published since the 1985 CDC guideline. These guidelines for hand washing and hospital environmental control provides and gave us specific recommendations to promote and enhance hand-hygiene practices and reduce transmission of pathogenic microorganisms to patients and personnel in health-care settings in order to decrease the risk of infection. And a study of the efficacy of alcohol-based hand washing or rubs and the low incidence of dermatitis associated with their use are reviewed. Studies find the value of hand-

hygiene promotion programs and the potential role of alcohol-based hand rubs in enhancing and improving hand-hygiene practices. The study recommendations focused on the use of surgical hand antiseptics, hand lotions or creams, and wearing of artificial fingernails are also included(Boyce & Pittet, 2002).

Health care–associated infection is considered as a major health problem in most neonatal intensive care units. And the Hand hygiene has been considered as the most important way in preventing hospital-acquired infection either in neonate or any department. So, this study about Hand Hygiene Practices in a Neonatal Intensive Care Unit (NICUs): A Multimodal Intervention and Impact on Nosocomial Infection conduct in NICUs in 2004. The study objective is to assess the frequency, working and way of patient contacts in neonatal intensive care units NICUs and observe the tendency, manor and technique of hand hygiene among health care workers HCWs before and after the performance of an intervention procedure. Using observation study to show the impression and frequency of contact to patient, the hand hygiene efficiency, and hand-washing techniques for health care workers. And apply an intervention course for 6 months consisted of task-orientated hand hygiene education, encourage of minimal handling protocol by clustering of nursing care with newborns , liberal items of up-to-date alcohol hand antiseptic, improvement in hand hygiene facilities, ongoing regular monitoring of hand hygiene, and implementation of health care–associated infection over locking and supporting . After that the study find that Overall hand hygiene compliance increased from 40% to 53% before patient contact for any procedure and 39% to 59% after patient contact for any interventions. More significant the improvement for high-risk procedures (35%–60%). The average number of patient contacts also decreased from 2.8 to 1.8 per patient per hour. So the health care–associated infection or nosocomial infection rate that decreased from 11.3 to 6.2 per 1000 patient-days. So, the study concluded that the reducing frequently touch for newborns, clustering of care, and task oriented educational for hand hygiene could help to decrease in health care–associated infection rate and advice to more farther observational study which could provide a regular feedback to HCWs to maintain the compliance with hand hygiene practice(Lam et al., 2004).

The overall compliance to infection control is the compliance of nurses to the usage of infection control policies, protocol and standers that can be affected by staff and hospital characteristics which may prevent spread of infection and form a realistic indication to increasing compliance of infection control in southern west bank hospitals. The compliance for infection control protocol may depend on the nature of hospital as governmental or nongovernmental hospital, because it needs systematic supervision and funding for equipment. For instance, hand gloves are done when the health care worker contact directly with patients' body fluids as blood, urine, cerebral spinal fluids, mucous …etc., during lab drawing or any invasive procedure for patients. And may need to wear double gloves when contact with isolation cases (Khair, 2013). Regarding hand washing compliance, across sectional study concluded that hand washing compliance following contact with patients with difficult infections was low. Poor access to sink is associated with decreased hand washing compliance. So, improvement strategies are urgently needed (Deyneko et al., 2016).Similarly, nurses uniform form as reservoir for microorganism that increase the probability health acquired infection, a Bacterial Contamination of Military and Civilian Uniforms in an Emergency Department study concluded that the emergency staff uniforms is a source for multi drug resistance (West et al., 2019).

For antiseptic usage compliance, item assertion from the Palestinian infection and training protocol to identify the rage use of antiseptic through nursing participants. The study result of a role of antiseptics in the prevention of surgical site infections on 2015(Echols et al., 2015), that numerous studies have demonstrated differences in bacterial colonization rates, few well-controlled investigations have demonstrated superiority of a given regimen. The alcohol-based iodophor and chlorhexidine products seem to exhibit greater efficacy than their aqueous counterparts. Regarding waste disposal compliance, hospitals are places that make high amount of medical waste every day, and they are wished by ministry of health and organizations laws, to achieve a medical waste removal plan and protocol. Poor planning and monitoring for medical waste removal form a good area for microorganism growth which leads to increase chance of health care acquired infection. The study of Medical Waste Collectors in Eastern Ethiopia concluded that the Medical waste collectors are exposed to high sharp injury and blood and body fluid. Adequate training before employment and on job, provision of personal protective devices and routine

exposure reporting mechanism, testing, medication and post exposure prophylaxis and establishment of therapeutic centers are recommended (Alemayehu et al., 2017).

This study will measure nursing attitudes and perception toward HCAI practices such as hand gloving, proper nurses uniforms, antiseptic usage, and hand washing and will try to identify if these are used as usual procedures followed by nurses on a daily routine care according to prevailed protocols at these hospitals.

2.7.2 Poor or negligence practices in infection prevention and control

According to oxford dictionary, Negligence defined as someone they have failed to do or practice that amount of care or something which they ought to do (Oxford dictionary, 2020). The Canadian Committee on Antibiotic Resistance reported that all blood and body fluids (urine, feces, wound drainage, sputum) contain infectious pathogens organisms either bacteria, virus or fungus. Routine and good Practices reduce frequency and volume exposure of blood/body fluid to the health care provider. So, demonstrating and applying good routine Practices decrease risk of transmission of microorganisms before and after any procedures or contact with patients/clients/residents. On the other hand neglecting and poor practicing for these standers and protocols increase the risk of pathogen transmission and occurrence of nosocomial infection(Canadian Committee on Antibiotic Resistance, 2007).

The standard Personal protective equipment (PPE) is used to protect health care workers and patient from the risks of cross-infection and infectious disease. It may also be needed for using of some hazardous chemicals solutions and some pharmaceuticals substance. PPE includes items gloves, aprons, masks, gown, goggles or visors and in certain critical situations such as during operations, it may also include hats and footwear. Using These Personal protective equipment with good practicing help to prevent and decrease the risk of health care acquired infection (Butvidas, 2005).

3. Chapter Three: Conceptual Framework

3.1 Introduction

Conceptual framework can be defined as a group of concepts that are broadly defined and systematically organized to provide a focus, a rationale, and a tool for the integration and interpretation of information. Usually expressed abstractly through word models, a conceptual framework is the conceptual basis for many theories, such as communication theory and general systems theory. Conceptual frameworks also provide a foundation and organization for the educational plan in schools of nursing (Mosby's Medical Dictionary, 2009).

The research framework was used to explore health care professionals' knowledge and attitudes and perceptions of health care acquired infection among nurses. Identification of the nurses' attitudes that influence health workers will be used to develop strategies to support health care workers with infection control practices at the hospitals.

3.2. KAP model:

This study employs the "KAP" model which usually measures the Knowledge, Attitude and Practices of the study population. It serves as an educational diagnosis of the study participants. The main purpose of this KAP study is to explore nurses' perceptions of their Knowledge, Attitude and Practices on controlling HCAI (Adwan, Abu-Hasan, et al., 2005)(Houpis et al., 2015).

Knowledge, attitude, and practice (KAP) study design is delegated of specific target populations to collect their information, idea, and scientific notifications on what is known, believed and done in relation to research topic, and it's the most available, easy, and frequently used study tool in health-seeking behavior research.

Participant's Knowledge is usually assessed to see if there is a combination between community knowledge corresponds to biomedical concepts. Usually systematic

normal manner typical questions include in knowledge questionnaire section which talks about causes and symptoms of the illness/issue under investigation.

Attitude according to oxford dictionary defined as a firm, or constant way of thinking or feeling about someone or something, typically one that were reflected in a person's behavior (dictionary o. , 2020). A learned redness to think, feel and act in a particular way towards a given object or class of objects. Attitude consists of and need a product of a complex interaction of beliefs, thoughts, skills, feelings, and values. So, every questionnaire use the KAP module have specific questions used to measure participants' attitudes.

Practices, according to oxford dictionary, defined as the actual or real application or use of an idea, thought, conceptions, belief, or method, as opposed to theories relating to it (dictonary, 2020). In KAP surveys, Practices usually discuss about the use of preventive interventions or different health care options in order to achieve study goals. Normally, moral, and routine questions are asked, therefore it hardly permits statements about actual practices; rather, its information on people's behaviors or on what they know should be done. So, it focuses on what to be done on correct way not what you know (Ul Haq et al., 2012).

A study search about Knowledge, Attitudes and Practices for Risk Education: how to implement KAP surveys aim to facilitate the implementation of a KAP survey and to provide a systematic basis for the collection and use of data on KAP survey. It's concluded that the KAP survey is directly linked to the planning and assessment of educational activities in work field. The data collected in KAP surveys are required for use to standardize information database and to set the priority of action and collect specific information about the knowledge, attitudes and practices of communities (Goutille et al., 2009).

When surveys used KAP model for data collection in quantitative methods, the team rallied on a programmer used to suggest health interventions or education activities in a local context as establishment infection control protocol. These information, when collected, support researchers to improve the efficiency of these activities and

to remove certain obstacles. It is very important not to neglect the size of resources and time necessary for the implementation of KAP surveys; these are costly and time-consuming undertakings. The KAP sampling and analysis for collected data are usually monitored and checked by an expert researcher (H E Ka P, n.d.).

3.3 Study dependent variables

Knowledge: the knowledge defined by medical dictionary as familiarity, awareness, or Understanding gained through experience or study(American Heritage® Dictionary, 2011).

Attitudes: Is personal or mental view of health care workers on infection prevention activities when caring for patients (Jemal et al., 2018).

Practice means the action of doing something regularly or frequently to promote your skill in some work. Exploring nursing practices in this study is measured through performance questions but not actually observed.

Operationally, the knowledge, attitudes, and practices of nurses regarding HCAI are individually measured by a set of questions in the self-administered questionnaire in this study as it is explained in the method chapter.

3.4 Study independent variables

There are many studies which prove the role of independent variables (characteristics of both: participants and hospitals) such as age, gender, marital status, level of education, current position, employment status, duration of working experience (in years), duration of work in the current nursing unit/department, staff income, and the type of hospital.

For this study, the independent variables could include:

a. Demographic variables: The following independent demographic variables are used in this study and therefore considered important:

Age: This refers to the age of the nurses 'participants. Data was collected and then grouped into five groups (less than25 years, between 25 – 30 years, between 30 – 35 years, and higher than 35 years)

Gender: This refers to male and female respondents on questionnaires.

Marital status: This refers to the social status of the respondent. It was categorized into two groups: Single, and Married. This variable may effect on psychological status for staff and may affect negatively or positively on health care acquired infection.

Level of Education: This refers to the level of education obtained by respondent's staff which may give us an expectation that increase the level of education lead to decrease of health care acquired infection. It was classified into three groups: Diploma degree, Bachelor degree, High diploma, Master degree, Doctoral degree, and others if there any other degrees.

Current position: It refers to the nurses' position obtained by participant using the current position phrase on study questionnaire and it's classified to six groups, Practical nurse who studies 2 years at nursing faculty, staff nurse who had Bachelor degree or more, Head nurse, Assistance head nurse, Matron, and others as infection control of quality nurse.

Employment status: This referred to the status of employment for staff depends on job contract which obtained by respondents. It's classified into four groups: Full time, part time, contract, and others as daily paid or volunteer.

Duration of working experience (in years): This refers to the duration of working experience by years since graduation until now.

Current department: This referred to the current department that participants work in, during study data collection. During data analysis it's classified into three groups, open department, closed departments and administration department.

The length of working in the current nursing unit/department: It's referred to the years of experience on the current unit or hospital which obtained by respondent.

Monthly salary (NIS): It depends on monthly per capita income, and it's categorized into four groups (less than 3000, 3000-4000, more than 4000-5000, or more than5000 New Israeli Shekel per month.

Type of hospital: This depends on hospitals that will agree to participate in the study. They are classified into 3 groups. Three of them are governmental hospital (Hebron Governmental Hospital, Al Muhtaseb, and Yattah Hospital). Another two hospitals are nongovernmental hospitals which are Palestinian Red Crescent Hospital and AL-Ahli Hospital. And the private sector selected just the largest hospital in Hebron is Al Mezan hospital.

b. Institutional preventive measures; these can be defined as the basic component for infection control precautions which are to be used, as a level of precautions, standards, protocols that are recommended when delivering the care to all patients, its effect on their presumed infection status either increase or decrease cross infections . (Ayed, 2015). Operationally, the institutional preventive measures regarding HCAI are measured by a set of questions in the self-administered questionnaire in this study as it is explained in the method chapter

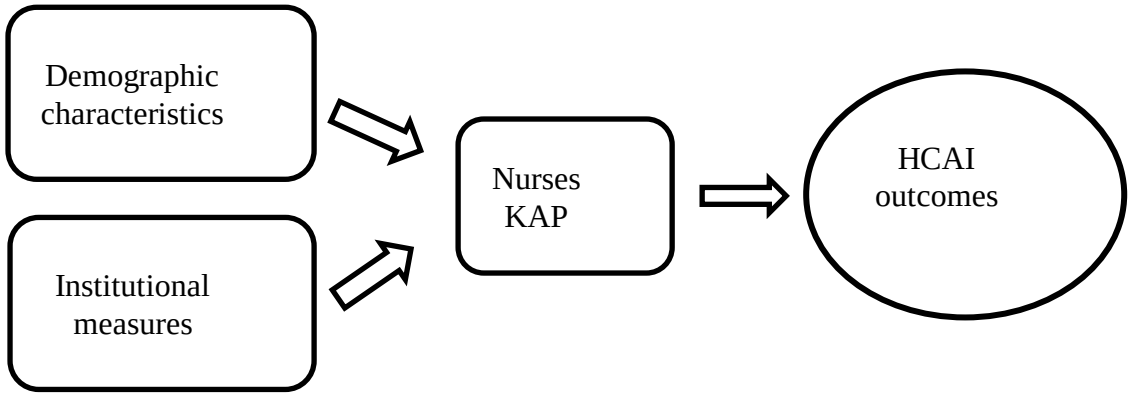

Figure 1: conceptual frame work

4. Chapter Four: Methodology

4.1 Introduction

This chapter summarizes and draws the methodology which is used to assess the impact of the demographic characteristics and workplace preventive measures on nurses' knowledge, attitudes, and practices toward HCAI. The design of this study is cross sectional study which is descriptive study and employs self-administered questioner as a tool to collect data. The researcher does not use observational tools to assess nursing professional aspects relevant to health care acquired infection among nurses at hospitals in Hebron. Furthermore, the chapter describes the study setting, study population, study design, sample criteria, data collection, and statistical analysis plan.

4.2 Research design

The study used quantitative, descriptive, cross sectional method to achieve the aim of this study. Data was collected from a sample of nurses at governmental, nongovernmental, and private hospitals working from all departments. Data was collected by using self-administered questionnaire that was distributed after obtaining the approval of targeted institutions and Al-Quds University ethical boards.

The data collection tool was a self-administered questionnaire which was distributed in the participants' workplace. This style of self-administrated questionnaire in workplace had an advantage that it can achieve more attention and focus toward filling in the questionnaire from the respondent which increase study efficiency. On the other hand, there are a lot of disadvantages for this style because its consuming a lot of time, money, and the participant may do not like to have the researchers in their departments or workplaces for many reasons (Jenkins & Dillman, 1997). This survey questionnaire took about 10–15 minutes to be completed. The questionnaire consisted of 69 item designed by the researcher. Some of these questions were collected from different previous researches like Zambia study (Shimaponda-Mataa et al., 2016). The remaining questions were developed by the researcher and reviewed by health academic experts (appendix No 1). All questions were translated to Arabic language

to facilities answering by the participants. The final questionnaire consisted of five parts:

Part 1. Social demographics section: There are 10 questions ask about general personal information such as: age, gender, marital status, educational level, current work position, employment status, years of experience, nurses department, experience in current department, and monthly salary.

Part 2. Information about some determinant and health care worker activities
There are 7 questions inquiring about some determinant and health care worker activities, such as attending infection prevention courses, the date of the last participation in infection control session, the presence of infection control committee in the hospital, the length of establishing this committee, the frequency of meetings of infection control committee, the type of medical uniform, and the routine of washing nurses' medical scrub.

Part 3.This section investigates the Knowledge of nurses toward HCAI. Healthcare-related infection (hospitalized infection) is the infection that people acquire when they receive health care in hospitals and other health care facilities. There are fourteen questions in this part. Participants were asked to answer these questions using the (X) or (√) at their convenience. The answers ranged from strongly agree, agree, neutral, disagree and strongly disagree.

Part 4. Attitudes of nurses toward HCAI. There are twelve questions in part 4 that examined the nurse's attitudes. The answers varied from strongly agree, agree, neutral, disagree and strongly disagree.

Part 5.Practices of nurses toward HCAI. There are twelve questions in this part that examined nurse's practices. The answers also varied from Strongly Agree, agree, neutral, disagree and strongly disagree.

Part 6 institutional measurement, there are 14 questions in this part that assess the institutional facilities, condition, and readiness to help health care workers to cooperate with health care acquired infection and infection control. The answers also varied from Strongly Agree, agree, neutral, disagree and strongly disagree.

4.3 Study Setting

The study is conducted at major governmental, non-governmental, and private hospitals which have the largest number of nurses and working on infection control protocols in Hebron. Governmental hospitals include Hebron Governmental Hospital, Al-Muhtaseb Hospital, and Yattah Hospital in Hebron. These hospitals are governedby Palestinian Ministry of Health (PMOH) which provides health services that are free or with small fees of charge for patients using Palestinian health insurance. These hospitals have infection control committees and large number of qualified nurses.

The study also includes the major non–governmental hospitals in the district, which also have the large number of nurses (Palestinian Red Crescent hospital and Al-Ahli Hospital). The private sector is represented by including Al-Mizan hospital in Hebron district.

The total number of nurses in Hebron Governmental Hospital is 325, Al-Muhtaseb Hospital 36 nurses, and Yattah Hospital 40 nurses, Palestinian Red Crescent Hospital 80nurses, Al-Ahli Hospital 300nurses, and Al-Mizan hospital 116 nurses. So the total number of research population is 897nurses.

4.4 Study Population

Study population includes all 897 nurses including practical nurses, staff nurses, assistant head nurses, head nurses, and matrons for each hospital included in the study.

4.5 Sample and Inclusion/exclusion Criteria

4.5.1 Study sample:

A convenience sampling technique was used to recruit nurses working at all governmental, non-governmental, and private hospitals at Hebron area. Governmental hospitals are Hebron Governmental Hospital, Muhammad Ali Al Muhtaseb hospital, and Yattah Hospital. These hospitals have infection control committees. The included non-governmental hospital are Red Crescent hospital and Al-Ahli Hospital in Hebron.

The private hospital which is included in our research is Al-Mizan hospital, which also has a high number of nurses and an infection control committee.

4.5.2 Sampling size

The total number of nurses within the selected hospitals is 897 nurses, without midwives. According to creative research system and survey monkey, sample size calculation must be not less than 270 questionnaires for this total population (system, 2020).

The researcher managed to collect more than 270 questionnaires to increase research power calculations. The researcher started the data collection from these 6 hospitals after getting approval from all administrations, the total number of questionnaires which were distributed for all hospitals was 426 questionnaires, 409 of participants completed the questionnaires, with a response rate of 96%.This response rate was not achieved easily, the researcher went to each hospital many times on deferent shifts for each visit as describe next. Research questionnaire selected depends on some previous studies, like Zambia study in 2017, and other question's modified and developed with my advisor, and take validity and approval after modification from 4 academic arbitrators.

Table 4. 1Number and percentage of participants from each hospital.

Hospital type	Hospital name	No of participants / Total No of Nurses	Percentage of participants from total populations	Percentage of participants from total sample
Governmental	**Hebron Hospital (Alia)**	**77/325**	**23.7%**	**18.8%**
	Muhammad Ali Al-Muhtaseb	**34/36**	**94.4%**	**8.3%**
	Nasser Hospital – Yattah	**37/40**	**92.5%**	**9.0%**
Non-Governmental	**Palestinian Red Crescent Hospital**	**64/70**	**91.4%**	**15.6%**
	Al-Ahli Hospital	**97/ 300**	**32.3%**	**23.7%**
Private hospital	**Al-Mizan Hospital**	**100/116**	**86.2%**	**24.4%**
Total		**409/887**	**46.1%**	**100%**

Data collection process

The researcher visited each of these institutions at least three times during the data collection phase in order to obtain a sufficient number of participants, these visits were conducted at different times with the aim of recruiting nurses from both morning and evening shifts. On each visit, the researcher distributed the questionnaires to all nurses in the wards of the hospital and then gave them enough time to fill in the questionnaire, and returned back to recollect questionnaires after one hour of distributing them. The first visit was done usually between the morning and afternoon period. Second visit was done during afternoon shift (B – shift) and the third visit was done during morning shift.

Al-Ahli hospital is a non-governmental hospital which is managed by Patient Friends Society in Hebron (PFS). It's one of the largest hospitals in the area. According to hospital administration, it employs300 nurses, all of them were given an equal chance to participate in this study. During the three visits, 97 questionnaires with a percentage of 32.3% of all nurses 'populations were collected from Al-Ahli hospital.

Palestinian Red Crescent Society PRCS is also a large non-governmental hospital in Hebron area which is more specialized in pediatrics and maternity care. According to hospital administration it has70 nurses, all of them had an equal chance to participate in this study. A total of 64 questionnaires with a percentage of 91.4 % of all hospital nursing populations were collected from PRCS.

Al Mezan hospital, the largest private hospital in Hebron area. According to hospital administration it employed 116 nurses, all of them had the same chance to participate in this study. A total of 100 questionnaires with a percentage of 86.2 % of all hospital nursing populations were collected from Al-Mezan hospital.

For Hebron Governmental Hospital (Queen Alia Hospital), it's the largest governmental hospital in southern Palestine. According to hospital administration it has 325 nurses, and all of them were given an equal chance to participate in this study. Total of 77 questionnaires with a percentage of 23.7 of all hospital populations were collected.

Muhammad Ali Al-Muhtaseb Governmental Hospital is providing health services to approximately 130,000 peoples of the southern region of Hebron city and surrounded areas. According to hospital administration it has 36 nurses, and all of them had the same chance to participate in this study. A total of 34 questionnaires with a percentage of 94.4% of all populations were collected.

For the last hospital, Yattah Governmental Hospital which is providing health services to approximately 160,000 peoples of Yattah and Al-Samou' town. According to hospital administration it employs40 nurses, and all of them were given an equal

chance to participate in this study. A total of 37questionnaires with a percentage of 92.5 %of all populations were collected from Yattah Governmental Hospital.

Sampling method:

In the current study, an accidental sampling (sometimes known as grab, convenience or opportunity sampling) which is a type of non-probability sampling that involves the sample being drawn from that part of the population which is close to hand. (Etikan, 2016)That is, a population is selected because it is readily available and convenient. It may be through meeting the person or including a person in the sample when one meets them.

4.5.3 Inclusion criteria:

Study population includes any nurse how works in the selected hospitals, so every nurse has a chance to participate in this study either working as part or full time in each hospital included in the study.

4.5.4 Exclusion criteria:

Nurses who do not work in Hebron hospitals were excluded from participating in this study. In addition, daily paid nurses and part-time nurses were asked to fill up only one questionnaire if they have double job and refer to the hospital characteristics he presents in at the time of data collection.

4.6 Ethical issue

The study proposal was presented for the Faculty of Public Health review board at Al-Quads University to take the approval to conduct this study. For governmental hospital, the approval was obtained from MOH, while for nongovernmental and private hospitals the approvals were obtained directly from the administration of each hospital.

Participants were assured that the provided information will be treated as confidential and the researcher undertakes not to reveal any individual information that appears in

this questionnaire. It took the participantsabout10-15 minutes to complete the questionnaire.

The questionnaire was distributed directly to nurses by hand or was given to nursing manager of each department on each hospital to be distributed to all nurses, and by giving a period of one to two weeks in order to reach all nurses at each department. Questionnaires were collected from head nurses as soon as possible after being completed from all staff. The participation was voluntary and the participants were provided with information sheet about the aim of the study and that the data will be treated with confidentiality.

4.7 Statistical Analysis:

The collected data via the questionnaires about nursing knowledge, attitudes, and practice toward health care acquired infection were entered and analyzed by using the Statistical Package for the Social Sciences IBM SPSS version 20. A convenient sample of 409 healthcare workers participated in this study as clarified in result chapter, Table 1, for a response rate of 100%, so the t test and one-way analysis of variance (ANOVA) used.

Continuous variables were expressed as means and standard deviations as appropriate. Frequencies and percentages were calculated for all categorical variables.

The results that were produced by Likert scale format were analyzed by the following categorization in measuring questionnaire's paragraphs**:**

Table 4. 2: Likert scale

Very high	High	Moderate	Low	Very low
5	4	3	2	1

Table 4. 3: measurement scale

Mean	Degree
More 3.5	High
2.5-3.5	Moderate
Less 2.5	Low

4.8 Validity and reliability of the instrument:

To verify the validity of the tool of study, it was presented to a group of reviewer who are specialized in this field (Appendix number 4). All their notes were taken into consideration. In addition, to check the reliability of the tool it was applied on a sample of nurses, which included 22 males and females other than those in the sample.

Table 4.4displays the Cronbach alpha reliability measure. Reliability is defined as the extent to which an instrument consistently measures a concept.

Table 4. 4: Cronbach alpha for each part

Dimensions	number of phrases	Cronbach alpha
Knowledge	14	0.82
Attitude	12	0.89
Practice	12	0.92
KAP	38	0.89
Institutional measures	14	0.88
All tools	52	0.87

From Table 4.4, it's observed that the reliability is high among the dimensions of health care acquired infection. This meant that the questionnaire was a reliable and valid instrument to explore the knowledge, attitudes, performance and practices. The questionnaire was self-administered.

4.9 Scope and Limitations of the Study.

- The place scope: The research covered all Hebron district's hospitals.
- -The human scope: The population that was targeted in the research consists of the selected nurses from all nurses in Hebron hospitals.
- This study examines nurses' knowledge, attitudes, practices, and their institutional measures, rather than real testing of their knowledge, attitude, practices, or examining the institutional real measures or directly observing their individual preventive performance, because its deceptive not observational study
- Another limitation is that only nurses are included in this study, while others health care providers (such as physicians, lab and radiology technicians, and administrators) are excluded from this study. In addition, this study assesses the knowledge, attitudes, and practices of \nurses in infection prevention and control measures just at major hospitals in Hebron district, which may limit the generalization of findings to other hospitals in Palestinian territories.
- There is no approved scale to measure nurses 'knowledge, attitudes, and practice of HCAI.
- In our institutions, there are not enough comprehensive protocols and policies about infection control, which help to prevent HCAI.

5. Chapter Five: Results

5.1 Study approach

The descriptive analytical approach is utilized in this study. This approach helps to understand the present situation and to make plans for future. It enables the researcher to investigate the level of nurse's knowledge, attitudes, practice (KAP) and Institutional measures toward health care acquired infection, and how these could influence the ability of nurses to perform activities and standard of infection control protocols which help to prevent cross infection among health care workers.

The demographic characteristics of the participants in this study are presented in table (5.1).

Table 5. 1 Demographic characteristics of participants (n=409)

Demographics	Characteristics	No.	%
Gender	**Male**	**238**	**58.2**
	Female	**171**	**41.8**
Age	**Less than 26**	**115**	**28.1**
	26-30	**136**	**33.3**
	30-35	**96**	**23.5**
	Higher than 35	**62**	**15.2**
Marital Status	**Single**	**119**	**29.1**
	Married	**290**	**70.9**
Level of education	**Diploma**	**125**	**30.6**
	Bachelor	**243**	**59.4**
	Postgraduate	**41**	**10**
Monthly income	**Less than 3000**	**110**	**26.9**
	3000-4000	**214**	**52.3**

	More than 4000	**85**	**20.8**
Current Position	**Practical Nurse**	**125**	**30.6**
	Registered Nurse	**241**	**58.9**
	Nursing Mangers	**43**	**10.5**
Employment Status	**Full time**	**369**	**90.2**
	Part-time	**40**	**9.8**
Department	**Open department**	**164**	**40.1**
	Close department	**238**	**58.2**
Participation in infection control courses	**Monthly**	**54**	**10.8**
	Yearly	**155**	**38.1**
	Other	**199**	**48.7**
Hospital type	**Government**	**148**	**36.2**
	Non-government	**161**	**39.4**
	Private	**100**	**24.4**

*Israeli shekels (1$ =3.46 shekels).

According to table (5.1), most of the participants were males; 58.2% (n= 238) while 41.8 % (n=171) were females. The majority of nurses aged between 26 to 30years old (n= 136, 33.3%), followed by less than 26 age group (n= 115 (28.1%) then 31 to 35 age group (n= 96 (23.5%) and finally above 35 years old (n= 62 (15.2%). The majority of participants were married (70.9% (n=290), while (29.1% (n=115) were single.

Most of nurses were registered nurses (58.9% (n=141) and had full time work (90.2% (n=369). Although, most of the nurses participated in infection control courses every time.

5.2 Results of study

In order to understand the study, we can use the key in the following table.

Table 5. 2: Key of Likert Scale

Mean	Scale
1 - 2.33	**Low**
2.34 – 3.66	**Intermediate**
3.67 – 5	**High**

Firstly: results related to the research question of what is the level of nurse's knowledge, attitudes, practice, and institutional measures toward healthcare acquired infections. Means and the standard deviations were calculated according to the 3 dimensions of KAP and institutional measures as shown in Table 5.3.

Table 5. 3: Mean and standard deviation of KAP's dimensions and Institutional Measures toward HCAI.

Themes	Number of phrases	Mean	SD	Level
Knowledge	**14**	**4.10**	**0.44**	**High**
Attitude	**12**	**4.04**	**0.41**	**High**
Practice	**12**	**3.60**	**0.45**	**Intermediate**
Total KAP	**38**	**3.83**	**0.39**	**High**
Institutional measures	**14**	**3.39**	**0.49**	**Intermediate**
All tools	**52**	**3.78**	**0.38**	**High**

From Table (5.3) the knowledge score showed a mean of 4.10 with a SD of 0.44. It therefore indicated that nurses had adequate knowledge on infection prevention and control. The attitude score showed a mean of 4.04 with a SD of 0.41. It therefore indicated that the nurses had positive attitudes towards infection prevention and control. The practice score showed a mean of 3.60 with SD of 0.45. It therefore indicated that nurses' practices to control HCAI was good. The level of nurse's total KAP toward health care-acquired infections was good with the mean score of 3.83 and SD=0.39.

Furthermore, the perception of participants about their institutional measures was good with regard to infection prevention and control (a mean of 3.39 with a SD of 0.49).

5.2.1 Level of nurse's knowledge to control for HCAIs.

Table5.4 presents numbers, percentages, means, and standard deviations of the knowledge responses of participants about HCAI.

Table 5. 4: Frequency of numbers, percentages, means, and standard deviations of participants' knowledge of HCAIs

Knowledge	Strongly dis agree	Disagree	Natural	agree	Strongly agree	Sum	SD
Handwashing and hygiene is the first line of defense against hospital-acquired infection	0 (0.0)	5 (1.2%)	23 (5.6%)	111 (27.1%)	270 (66.1%)	4.57	0.660
Hospital acquired infections can be transmitted through medical equipment that is used for external examinations, such as: medical stethoscopes, endoscopes, and ophthalmoscopes	1 (0.2%)	2 (0.5%)	17 (4.2%)	174 (42.5%)	215 (52.5%)	4.46	0.626
Hands are the most common way to transmit microorganisms and cause hospital acquired infections	1 (0.2%)	8 (2%)	28 (6.8%)	144 (35.2%)	228 (55.7%)	4.44	0.731
All medical staffs and patients must be considered at risk for infection within hospitals	3 (0.7%)	10 (2.4%)	27 (6.6%)	160 (39.1%)	209 (51.1%)	4.36	0.779
Infection control protocols should be applied to all hospitalized patients at all times	0 (0.0)	11 (2.7%)	27 (9%)	195 (47.7%)	166 (40.5%)	4.25	0.733
Precautions / standards necessary to prevent or reduce infection must be applied to all hospitalized patients, regardless of their diagnosis	2 (0.5%)	11 (2.7%)	45 (11%)	197 (48.2%)	154 (37.6%)	4.19	0.774
The hospital acquired infection can be transmitted through the patient's external medical procedures and interventions such as measuring vital signs	1 (0.2%)	15 (3.7%)	44 (10.8%)	217 (53.1%)	132 (32.2%)	4.12	0.762

The main reason for acquiring infection in hospital is medical procedures that deal with body fluids, such as urinary catheters and nasal tube insertion	1 (0.2%)	20 (4.9%)	65 (15.9%)	166 (40.6%)	157 (38.4%)	4.11	0.864
The antibiotic-resistant bacterium is one of the most important causes of infection within hospital departments	2 (0.5%)	26 (6.4%)	54 (13.2%)	179 (43.8%)	148 (36.2%)	4.06	0.886
Acquired health services infection is an infection that health care providers could get from patients	3 (0.7%)	17 (4.2%)	47 (11. 5%)	236 (57.7%)	106 (25.9%)	4.02	0.775
A daily shower for health care professionals is a universal precaution to prevent and control infection	3 (0.7%)	25 (6.1%)	56 (13.7)	196 (47.9%)	129 (31.6%)	4.02	0.872
Infections of the bloodstream may occur as a result of hospital acquired infections	3 (0.7%)	17 (4.2%)	68 (16.6%)	208 (50.9%)	113 (27.6%)	3.99	0.820
Acquiring hospital infection is considered one of the major complications of surgeries	2 (0.5%)	23 (5.6%)	80 (19.9%)	194 (47.4%)	110 (26.9%)	3.93	0.852
It is possible to stop the activity of microorganisms using distilled water	56 (13.7%)	116 (28.4%)	111 (27.1%)	91 (22.2%)	35 (8.5%)	2.90	2.351
						4.10	0.44

According to Table 5.4, the majority of nurses agreed that handwashing and hygiene was the first line of defense against hospital-acquired infection (93% all partcipant). Moreover, the 42% of participants disagree about the item (It is possible to stop the activity of microorganisms using distilled water) which have a low mean 2.90 ± 2.351

5.2.2 Level of nurse's attitude toward Care-acquired infections.

Table5.5 presents numbers, percentages, means, and standard deviations of the attitudes responses of participants about HCAI.

Table 5. 5: Frequency of numbers and percentages of participants' attitudes of HCAIs

Attitude	Strongly dis agree	Disagree	Natural	agree	Strongly agree	Sum	SD
The established infection prevention guidelines improve the patient's test results and keep him safe	0 (0.0)	4 (1%)	26 (6.4%)	184 (45%)	195 (47.7%)	4.39	0.653
Increasing the number of visitors periodically increases the possibility of infection transmission within the hospital	2 (0.5%)	16 (3.9%)	32 (7.8%)	146 (35.7%)	213 (52.1%)	4.36	0.910
I must implement the instructions of infection control procedures at our department	0 (0.0)	12 (2.9%)	27 (6.6%)	192 (46.9%)	178 (43.6%)	4.30	0.724
Preparing sterile or clean medications in a special room helps in reducing acquired infection	2 (0.5%)	17 (4.2%)	31 (7.6%)	180 (44%)	179 (43.8%)	4.25	0.811
Daily cleaning of staffs uniform helps prevent and control infection	1 (0.2%)	7 (1.7%)	48 (11.7%)	189 (46.2%)	164 (40.1%)	4.23	0.742
I believe that implementing the guidelines of infection control will reduce hospital acquired infection rates	0 (0.0)	11 (2.7%)	34 (8.3%)	220 (53.8%)	144 (35.3%)	4.20	0.704
I must attend training workshops regularly on infection prevention and control	1 (0.2%)	9 (2.2%)	43 (10.5%)	222 (54.3%)	134 (32.7%)	4.16	0.716
It is my responsibility to integrate with hospital infection guidelines and policies	3 (0.7%)	13 (3.2%)	33 (8.1%)	249 (60.9%)	111 (27.1%)	4.10	0.827
Workload or work pressure affects the ability to apply infection prevention measures and guidelines	8 (2%)	22 (5.4%)	37 (9%)	193 (47.2%)	149 (36.4%)	4.10	0.915
I know how to prevent and control hospital acquired infections	3 (0.7%)	16 (3.9%)	60 (14.7%)	235 (57.5%)	95 (32.4%)	3.96	0.769

Bring food and drinks from outside the hospital to the department may cause and increase the risk of infection to spread inside the hospital	6 (1.5%)	46 (11.2%)	99 (24.2%)	167 (40.8%)	91 (22.2%)	3.70	0.978
In the absence of sufficient rooms to isolate the infected patient, patients with same infectious diseases can be placed in the same department with other patients	42 (10.3%)	95 (23.2%)	74 (18.1%)	105 (25.7%)	93 (22.8%)	2.76	1.309
Total						4.04	0.41

According to table (5.5), the majority of nurses (93%) agreed with the attitude item "The established infection prevention guidelines improve the patient's test results and keep him safe". The lowest mean (2.76±1.309) there are 48.5% of nurses agree about the item "In the absence of sufficient rooms to isolate the infected patient, patients with same infectious diseases can be placed in the same department with other patients".

5.2.3. Level of nurse's practice to control for HCAIs.

Table5.6 presents numbers, percentages, means, and standard deviations of the practice responses of participants to control HCAI.

Table 5. 6: Frequency of numbers, percentages, means and standard deviations for nurses 'practices of HCAI

Practices	Strongly dis agree	Disagree	natural	agree	Strongly agree	Sum	SD
I wash my hands before and after handling patients	2 (0.5%)	13 (3.3%)	27 (6.6%)	170 (41.6%)	197 (48.1%)	4.32	.782
I wear medical gloves when performing any medical intervention and handling patients body fluids	3 (0.7%)	22 (5.4%)	26 (6.4%)	165 (40.3%)	193 (47.2%)	4.27	.863
I rub my hands with alcohol-containing disinfectant when handling patients in order to reduce the spread of infection	8 (2%)	16 (3.9%)	29 (7.1%)	175 (42.8%)	181 (44.2%)	4.22	.892

When handling patient's sheets, personal protective equipment is worn	4 (1%)	14 (3.4%)	41 (10%)	202 (49.4%)	148 (36.2%)	4.15	.813
It is not allowed to shake patient's sheets to get rid of dust before sending it to the washing department	15 (3.7%)	22 (5.4%)	30 (7.3%)	156 (38.1%)	186 (45.5%)	4.14	1.028
I believe that all patients in our department expect from me to wash my hands before and after handling them	2 (0.5%)	15 (3.7%)	45 (11%)	213 (52.1%)	134 (32.8%)	4.11	.780
We consider using a shaving machine to shave the surgical site at the right time is an important way to prevent the spread of infection	10 (2.4%)	24 (5.9%)	78 (19.1%)	206 (50.4%)	91 (52.2%)	3.84	.999
Considering my responsibilities, I have enough time to implement infection control and prevention guidelines	14 (3.4%)	41 (10%)	98 (24%)	198 (48.4%)	58 (14.2%)	3.57	.954
I wear a face mask when making any medical intervention with patients	21 (5.1%)	57 (13.9%)	103 (25.2%)	134 (32.2%)	94 (23%)	3.52	1.132
I think the needle should be recapped after use and before disposal to prevent stick and transferring the infection	68 (16.6%)	81 (19.8%)	39 (9.5%)	80 (19.6%)	141 (34.5%)	2.67	1.520
If medical gloves are not available, you can handle patient's body fluids such as blood or urine with bare hands	36 (8.8%)	68 (16.6%)	33 (8.1%)	81 (19.8%)	191 (46.7%)	2.23	1.405
When wearing gloves, no need to wash your hands	37 (9%)	40 (9.8%)	24 (5.9%)	169 (41.3%)	139 (34%)	2.20	1.255
Total						3.60	0.45

From the table (5.6), the findings showed an intermediate average of practice feedback of (3.60±0.45). 89.7% of participants agreed with the item "I wash my hands before and after handling patients" with high mean 4.32± 0. 782. Where are 18.8 % of nurses with the lowest mean (2.2±1.255) was for the practice item "When wearing gloves, no need to wash your hands".

5.2.4. The level of institutional measures to control acquired infections as perceived by nurses.

Table5.7 presents numbers, percentages, means, and standard deviations of the institutional measures at participant's hospitals to control HCAI.

Table 5. 7: Frequency of numbers, percentages, means and standard deviations for institutional measures to control HCAI

institutional measures	Strongly dis agree	Disagree	natural	agree	Strongly agree	Sum	SD
All medical instruments and equipment are completely sterilized in the sterilization department	4 (1%)	17 (4.2%)	46 (11.2%)	188 (46%)	154 (37.7%)	4.13	0.850
The Infection Control Committee is responsible for conducting periodic seminars or courses to increase the awareness and how to reduce the spread of infection	6 (1.5%)	27 (6.6%)	38 (9.3%)	229 (56%)	109 (26.6%)	3.98	0.867
Some types of germs or infectious disease are reported to the Ministry of Health once it is discovered	11 (2.7%)	32 (7.8%)	74 (18.1%)	165 (40.3%)	127 (31%)	3.87	1.017
The hospital's infection control committee follows and monitors the work of the medical staff and the results of cultures for patients	17 (4.2%)	39 (9.5%)	75 (18.3%)	203 (49.6%)	75 (18.3%)	3.66	1.006
The hospital director and supervisors monitor the staff medical knowledge of the infection prevention and control	23 (5.6%)	44 (10.8%)	84 (20.5%)	173 (42.3%)	85 (20.1%)	3.60	1.094
Hospital administrators and supervisors monitor all patients at risk for infection to take the necessary precautions to protect them from acquiring the infection	27 (6.6%)	58 (14.2%)	98 (24%)	167 (40.8%)	59 (14.4%)	3.39	1.089
The patient is usually examined to detect colonization of microorganisms regardless of whether there is enough evidence of infection or not	22 (5.4%)	71 (17.4%)	99 (24.2%)	151 (36.9%)	66 (16.2%)	3.38	1.100

I believe that infection control and prevention policies, standards and regulations are adequate in the hospital	18 (4.4%)	66 (16.1%)	123 (30.1%)	145 (35.5%)	57 (14%)	3.37	1.044
This hospital is well prepared for the knowledge, training and equipment needed to prevent an outbreak of infection	30 (7.3%)	73 (17.8%)	113 (27.6%)	133 (32.5%)	60 (14.7%)	3.27	1.130
All medical staff participate every year in a training course / workshop on infection prevention and control	34 (8.3%)	77 (18.8%)	117 (28.6%)	127 (31.1%)	54 (13.2%)	3.19	1.132
The personal protective equipment necessary to deal with patients is available in the hospital at all times	44 (10.8%)	81 (19.8%)	99 (24.2%)	135 (33%)	50 (12.2%)	3.12	1.174
Specific vaccinations are always provided to medical staff in order to prevent health care acquired infections	59 (14.4%)	81 (19.8%)	84 (20.5%)	123 (30.1%)	62 (15.2%)	3.06	1.268
This hospital conducts periodic survey of all employees in order to control the spread of infections	63 (15.4%)	96 (23.5%)	103 (25.2%)	100 (24.4%)	47 (11.5%)	2.90	1.227
Infection prevention standards and guidelines are not important for this hospital	27 (6.6%)	77 (18.8%)	59 (14.4%)	152 (37.2%)	94 (23%)	2.50	1.216
Total						3.39	o.59

From table (5.7), the results showed that the vast majority of 83.7% participants agreed that the institutional measures (All medical instruments and equipment are completely sterilized in the sterilization department) with high mean of (4.13±0.850). And 25.4 % of the nurses disagreed with the item "Infection prevention standards and guidelines are not important for this hospital" where the lowest mean score is 2.50±1.216. Moreover, the institutional measures average was 3.39 ± 0.59 which indicated a moderate institutional measures.

5.2.5: The relationship between the sociodemographic variables and the KAP dimensions

The relationship between knowledge, attitudes, practice, and total KAP scores and socio-demographic characteristics were tested by using - t test and one-way analysis of variance (ANOVA). The results came as in the following table:

Table 5. 8: Dimensions of KAP scores grouped by socio demographic characteristics of this study.

Item	Knowledge		Practice		Attitude		Total KAP	
Characteristic	**Mean± SD**	**P**	**Mean ± SD**	**p**	**Mean ± SD**	**P**	**Mean ± SD**	**p**
Gender								
Male	**4.11±0.48**	**0.93**	**3.75± 0.47**	**0.15**	**4.04±0.43**	**0.82**	**3.82±0.41**	**0.34**
Female	**4.10±0.36**		**3.64±0.37**		**4.04±0.37**		**3.85±0.37**	
Age								
Less than 26	**4.06±0.39**	**0.12**	**3.64±0.46**	**0.24**	**3.99±0.43**	**0.03**	**3.79±0.39**	**0.19**
26-30	**4.09±0.42**		**3.54±0.42**		**4.0±0.40**		**3.72±0.34**	
More than 30-35	**4.08±0.44**		**3.63±0.46**		**4.08±0.39**		**3.79±0.39**	
More than 35	**4.22±0.52**		**3.60±0.48**		**4.16±0.37**		**3.87±0.37**	
Marital Status								
Single	**4.09±0.39**	**0.71**	**3.56±0.46**	**0.27**	**3.99±0.44**	**0.13**	**3.77± 0.39**	**0.63**
Married	**4.11±0.45**	**5**	**3.62±0.44**		**4.06±0.39**		**3.79±0.37**	
Educational level								
Diploma	**4.07±0.42**	**0.00**	**3.61±0.45**	**0.28**	**4.02±0.41**	**0.03**	**3.76±0.38**	**0.02**
Bachelor	**4.08±0.40**	**2**	**3.58±0.45**		**4.02±0.41**		**3.79±0.36**	
Postgraduate	**4.33±0.60**		**3.70±0.47**		**4.20±0.37**		**3.95±0.36**	
Monthly income								
Less than 3000	**4.05±0.41**	**0.27**	**3.60±0.45**	**0.76**	**3.97±0.39**	**0.01**	**3.75±0.37**	**0.06**
3000-4000	**4.11±0.40**		**3.59±0.42**		**4.03±0.42**		**3.77±0.36**	
More than 4000	**4.15±0.54**		**3.63±0.52**		**4.16±0.38**		**3.84±0.39**	

Current Position								
Practical Nurse	**4.07±0.42**	**0.01**	**3.61±0.45**	**0.88**	**4.02±0.42**	**0.09**	**3.76±0.38**	**0.52**
Registered Nurse	**4.08± 0.40**		**3.59±0.44**		**4.02±0.40**		**3.77±0.36**	
Nursing management	**4.29±0.61**		**3.61±0.49**		**4.17±0.44**		**3.90±0.39**	
Employment Status								
Full time	**4.10±0.41**	**0.81**	**3.60±0.45**	**0.49**	**4.04±0.41**	**0.48**	**3.78±0.37**	**0.93**
Part-time	**4.09±0.64**		**3.55±0.47**		**4.0±0.43**		**3.79±0.39**	
Department								
Open department	**3.80±0.36**	**0.47**	**3.62±0.42**	**0.52**	**4.07±0.39**	**0.19**	**3.80±0.36**	**0.06**
Close department	**3.77±0.38**		**3.59±0.47**		**4.01±0.42**		**3.77±0.38**	
Participation in infection control courses								
Monthly	**4.08±0.46**	**0.53**	**3.71±0.46**	**0.07**	**4.02±0.49**	**0.34**	**3.86±0.41**	**0.55**
Yearly	**4.17±0.45**		**3.61±0.44**		**4.08±0.41**		**3.82±0.37**	
Other	**4.04±0.41**		**3.56±0.44**		**4.01±0.38**		**3.73±0.36**	
Hospital type								
Government	**4.19±0.36**	**0.005**	**3.67±0.47**	**0.03**	**4.18±0.38**	**0.00**	**3.85±0.39**	**0.04**
Non-government	**4.04±0.50**		**3.59±0.43**		**3.98±0.41**		**3.77±0.36**	
Private	**4.05±0.40**		**3.51±0.44**		**3.93±0.40**		**3.68±0.35**	

The results in table (5.8) showed that there was a significant association between knowledge and education, current position, and hospital type. The more positive knowledge was for the postgraduate level (4.33±0.60, p-value=0.002) and for those workers in the management (4.29±0.61, p-value=0.001) as well as the workers at government hospital (4.19±0.36, p-value=0.005).

Also, there was a significance relationship between practice and hospital types. The high practice mean was for the nurses who work in governmental hospitals (3.67±0.47, p-value=0.03) rather than workers at private or non-government hospital.

For the Attitude dimension, there was a significance relationship between attitude and age, education level, monthly income and hospital type. The high or positive attitude was for workers whose age less than 26 years (3.99±0.43, p-value= 0.03) and postgraduate level (4.20±0.37, p-value=0.03) with those workers who had income more than 4000 shekels (4.16±0.38, p-value=0.01). Also the workers at government hospitals (4.18±0.38, p-value= 0.001) scored more on practice than those in private or non-government hospital.

Furthermore, there was a significant relationship between the total KAP and education level and hospital type. The more positive KAP was for the postgraduate level (3.95±0.36, p-value=0.02) and for those workers at the government hospital (3.85±0.39, p-value=0.04).

For the institutional measures, Table 5.9 shows that there was a significance relationship between institutional measure and age and hospital type. These measures were higher at institutions where workers age less than 26 years (3.5±0.62, p-value=0.01) than the other age group and for those who worked at non- government hospital (3.47±0.60, p-value=0.04).

Table 5. 9: The relationship between Institutional measures and sociodemographic characteristics.

Item	**Institution Measures**	
Characteristic	**Mean ± SD**	**p**
Gender		
Male	**3.36±0.71**	**0.46**
Female	**3.42±0.67**	
Age		
Less than 26	**3.79±0.39**	**0.19**
26-30	**3.72±0.34**	
More than 30-35	**3.79±0.39**	
More than 35	**3.87±0.37**	
Marital Status		
Single	**3.43±0.65**	**0.44**
Married	**3.37±0.71**	

Educational level		
Diploma	**3.37±0.69**	**0.29**
Bachelor	**3.37±0.70**	
Postgraduate	**3.55±0.68**	
***Monthly income**		
Less than 3000	**3.41±0.61**	**0.45**
3000-4000	**3.34±071**	
More than 4000	**3.45±0.74**	
Current Position		
Practical Nurse	**3.37±0.69**	**0.29**
Registered Nurse	**3.37±0.71**	
Nursing management	**3.54±0.58**	
Employment Status		
Full time	**3.38±0.69**	**0.39**
Part-time	**3.48±0.67**	
Department		
Open department	**3.39±0.66**	**0.83**
Close department	**3.38±0.72**	
Participation in infection control courses		
Monthly	**3.60±0.60**	**0.06**
Yearly	**3.43±0.69**	
Other	**3.29±0.71**	
Hospital type		
Government	**3.39±0.81**	**0.04**
Non-government	**3.47±0.60**	
Private	**3.25±0.63**	

5.2.6 The relationship between hospitals' preventive measures and nurses' knowledge, attitudes, and practices regarding HCAI?

In order to find this relationship, the Pearson Correlation between the three dependent variables (KAP) and independent variable (Intuitional measure) was used as seen in table (5.10)

Table 5. 10: Correlations between the three dependent variables (KAP) and independent variable (Intuitional measure).

		Mean_ I.M	Mean_K	Mean_A	Mean_P	KAP	Mean all
Institutional measurement	Pearson Correlation	1	.261**	.438**	.660**	.639**	.786**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	407	407	407	407	407	407
Knowledge	Pearson Correlation	.261**	1	.617**	.188**	.701**	.634**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	407	408	407	407	408	408
Attitude	Pearson Correlation	.438**	.617**	1	.292**	.741**	.714**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	407	407	407	407	407	407
Practice	Pearson Correlation	.660**	.188**	.292**	1	.783**	.808**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	407	407	407	407	407	407
KAP	Pearson Correlation	.639**	.701**	.741**	.783**	1	.978**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	407	408	407	407	408	408
Mean all	Pearson Correlation	.786**	.634**	.714**	.808**	.978**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	407	408	407	407	408	408

**. Correlation is significant at the 0.01 level (2-tailed).

If the level of significance is 0.05 or less, the compared group is considered to be significantly different.

The findings showed that the relationship between knowledge and institutional measures was 0.617. The relationship between attitudes and institutional measures was 0.292, while the relationship between institutional measures and practice was the highest (0.66), which indicated moderately strong positive linear relationship).

The results might conclude that a positive correlation was found between the variables in which an increase in one variable is associated with an increase in the other. All the correlation between institutional measures variable had a positive relationship with KAP variables even if it's weak. The results indicated that knowledge, attitude and practice were in the same direction of the institutional measures, i.e. if one of them increased then the others would also increase.

5.2.7: Regression analysis

To test the relationship between the institutional measures and knowledge, attitude, practice and overall KAP, multiple regression analysis was done as seen in table (5.11-5.13). All variables were included in this model.

Table 5. 11: Regression analysis: the impact of institutional measure on knowledge, attitude, practice and overall KAP

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.717a	.515	.510	.31669

Table 5. 12 (ANOVA)-: impact of institutional measure on KAP and overall KAP.

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	42.752	4	10.688	106.570	.000b
Residual	40.317	402	.100		
Total	83.069	406			

Table 5. 13: Regression analysis: impact of institutional measure on KAP and overall KAP. (Coefficients)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.182	.171		6.905	.000
Knowledge	.514	.167	.501	3.084	.002
Attitude	.787	.151	.716	5.197	.000
Practice	.917	.163	1.414	5.619	.000
Overall KAP	1.558	.466	1.350	3.343	.001

a. Dependent Variable: institutional measure

From Table 5.11value of R-square (71.7%), it can be said that 71.7% of the variance in KAP scores for nurses can be explained by the institutional measures. The value of adjusted R-square (0.515) indicates that when this model is applied for the population of nurses (generalize the result), then the institutional measure scores can explain 51.5% of the variances in their KAP scores. The moderately high value of R-square along with a very small gap between R-square value and adjusted R- square value indicate that the model is fairly successful to explain the impact of institutional measure on individual Knowledge, Attitudes, and Practice and overall KAP. However, whether the model along with the parameters (KAP) is significant or not, will be revealed by analysis of variance (ANOVA) showed in Table 5.12 and the regression coefficients (Table 5.11). The ANOVA results in Table 5.12indicate that since the p-value is less than 0.05, we conclude that the overall regression analysis is significant, i.e. there is an impact of institutional measure on KAP.

Table 5.13 denotes that the p-values for knowledge, attitude and practice are below 0.05. Hence, we conclude that the regression model parameters are significant, i.e. there is a significant impact of institutional measure on knowledge, and attitude, practice and overall KAP score. The coefficient value represents the mean change in the institutional measure given a one unit change in the KAP and overall KAP score.

To find the impact of the significant demographic variables on overall KAP, multiple regression analysis is conducted. The results are given in Tables 5.14.

Table 5. 14: The impact of the significant demographic variables on overall KAP (ANOVA) and (regression).

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.734	3	.245	1.726	.161[b]
	Residual	57.313	404	.142		
	Total	58.047	407			

(Regression).

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.729	.086		43.406	.000
	Education Level	.068	.057	.108	1.197	.232
	Current Position	-.005	.056	-.008	-.088	.930
	Hospital Type	-.038	.038	-.049	-.992	.322

The ANOVA results in Table 5.14 indicate that since the p-value is larger than 0.05, we conclude that the overall regression analysis is not significant, i.e. There is no difference among group means related to the overall KAP.

Chapter Six: Discussion

6.1Introduction:

This chapter discusses the results of the current research and connect them with available literature review on the topic. The chapter ends with a final conclusion and recommendations for both levels, at hospitals and national levels.

The knowledge of 409 participants about HCAI was assessed in this study. The overall Knowledge scores showed a mean of 4.1 with a SD 0.44, which indicates that nurses have adequate knowledge of infection control and prevention. The majority of nurses agreed that hand washing and hygiene is the first line of defense against hospital-acquired infection (4.57±0.660). Moreover, the participants disagreed about the item (It is possible to stop the activity of microorganisms using distilled water) which has a low mean of 2.90 ± 2.351.

Our finding in knowledge scores were compatible with a previous study conducted in private hospitals located in the capital city of Yamen in 2017, which found that most of nurses had a fair level of knowledge about infection control. Another study in King Abdul-Aziz hospital in Saudi Arabia confirmed that nurses' knowledge was fairly good, and there was still a wide scope of improvement with regular educational program and training. Our result was not compatible with a study of surgical site infection (SSI) which aimed to assess the level of nurses' knowledge about SSI and risk of wound infections among medical physician in Abdul-Aziz university hospital that concluded the level of knowledge about SSI and risk of wound infection among respondent should be improved to secure better wound healing and quality of care. In addition, another cross sectional study from Weill Cornell Medical College, Qatar a conducted to assess knowledge, awareness, and attitude regarding infection prevention and control among medical students, found those students in Qatar had inadequate knowledge.

For the attitude dimension in this study, there was a significant association between age, educational level, monthly income, hospital types and attitudes. According to Table 5.5 in results chapter, the majority of nurses (4.39±0.653) agreed with the

attitude item “The established infection prevention guidelines improve the patient's test results and keep him safe”. The statements have a positive practice and a high mean. The lowest mean (2.76±1.309) was for the attitude item “In the absence of sufficient rooms to isolate the infected patient, patients with same infectious diseases can be placed in the same department with other patients” which have the lowest mean. According to the literature review there is a descriptive study on Jordanian nursing students in 2015 found that attitudes toward infection control protection were found to be positive which is similar to our findings. On the other hand, across sectional study which was conducted in India 2015 showed that health care workers needed to improve and enhance their attitudes toward infection control measures.

For the Practice dimension, there was significance association between practice & hospital type. The high practice mean was for the nurses who work in Governmental hospital type (3.67±0.47, p-value=0.03) rather than workers at private or non-government hospital.

Table 5.6 shows that there was an intermediate average of practice feedback (3.60±0.45). The majority of participants agreed with the item “I wash my hands before and after handling patients” with high mean 4.32± 0. 782. Where the lowest mean (2.2±1.255) was for the practice item “When wearing gloves, no need to wash your hands”. There is a study conducted in Ethiopia 2019 for 423 nurses to assess the practice toward prevention of SSI which found that more than half of participants practicing inappropriately. On the other hand, there is descriptive study conducted in Turkey aimed to determine nurse's knowledge and infection control practices in neutropenic patients, showed that nurses practice toward infection control were found inadequately.

According to study results, it is found that all the correlation between institutional measures variable are positive with KAP variables even if it’s weak. The results indicate that knowledge, attitude and practice will move in the same direction of the institutional measures, i.e. if one of them increases, then the others will also increase. As example, we see the vast majority of participants agreed about the institutional measure (All medical instruments and equipment are completely sterilized in the sterilization department) with high mean 4.13±0.850. The nurses disagreed with the

item “Infection prevention standards and guidelines are not important for this hospital” with the lowest mean score (2.50±1.216). Moreover, the institutional measures average was 3.39 ± 0.59 which indicate a moderate implementation of institutional measures.

Table 5.12 in result chapter denotes that the p-values for knowledge, attitude, and practices were below 0.05. Hence, we conclude that the regression model parameters were significant, i.e. there was a significant impact of institutional measures on individual knowledge, attitude, and practice dimensions and on the overall KAP score. The coefficient value represented the mean change in the institutional measures given a one unit change in the KAP and overall KAP score.

The results of this study agree with previous study which conducted by Butvidas in 2005 about the standard Personal protective equipment (PPE) which used to protect health care workers and patients from the risks of cross-infection and infectious disease. Using these personal protective equipment with good practicing help to prevent and decrease the risk of health care acquired infections.

6.2 Conclusion

As a summery, there was a significance association between Practice & Hospital type. The high practice mean was for nurses who work in Governmental hospital type (3.67±0.47, p-value=0.03) rather than workers at private or non-government hospital. For the Attitude dimension, there was a significance association between attitude and age, education level, monthly income and Hospital type. The high attitude for the workers who aged less than 26 years (3.99±0.43, p-value= 0.03) and postgraduate level (4.20±0.37, p-value=0.03) with those workers who had income more than 4000 shekels (4.16±0.38, p-value=0.01). Also workers at the government hospitals (4.18±0.38, p-value= 0.001) had more practice than those in private or non-government hospital. For the knowledge dimension there was a significant association between knowledge and education, current position and hospital type. The more positive knowledge was for the postgraduate level (4.33±0.60, p-value=0.002) and for those workers in the management positions (4.29±0.61, p-value=0.001) as well as the workers at government hospital (4.19±0.36, p-value=0.005). For the institutional measures dimension, there was a significance association between institutional measures and age

and hospital type. The institutional measures were higher for the workers whose age less than 26 years (3.5±0.62, p-value=0.01) than the other age group and for those who work at non- government hospitals (3.47±0.60, p-value=0.04).Moreover, the institutional measures average was 3.39 ± 0.59 indicated a moderate institutional measures. This means that these results agreed with our hypothesis about hospital polices protocols, and institutional measures. Finally, there was a significant association between KAP and education and hospital type. The more positive KAP was for the postgraduate level (3.95±0.36, p-value=0.02) and for those workers at government hospital (3.85±0.39, p-value=0.04).

6.3 Recommendations:

After discussing the results of this study, it is recommended to enhance the nursing team knowledge, attitudes, and practices toward HCAI prevention at two levels:

6.3.1Operational level (hospital):

1. Enhance the infection control committees and empower their roles in all Palestinian hospitals.
2. Conduct continuous professional development programs, both theoretical and practical, to improve health care workers' knowledge, attitudes, and practices to control HCAIs.
3. Provide an orientation program about health institutional protocols and policies for nursing team.
4. Follow specific and strict policies and measures for infection prevention to improve the nursing staff commitment of implementing HCAIs control protocols.
5. Obtain continuous feedback from health care workers about the effective HCAI prevention criteria and protocols.
6. Provide the necessary equipment for controlling HCAIs all the time.
7. Establish monitoring system on HCAI outcome in order to enhance patient quality of care

6.3.2 National level:

1. Review Palestinian policies and protocols about infection control in order to keep them update according to WHO protocols and recommendations.
2. Engage health care workers with external international health care institutions to improve nurses' KAP to control HCAIs.
3. It is recommended that governmental, non-governmental and private hospitals to participate in international standard infection control prevention programs like Joint Commission International (GCI), or international standardization organization (ISO).
4. Encourage researchers to conduct national studies on how to enhance KAP level and to determine factors that affect HCAI prevention in all Palestinian hospitals.
5. Instruct Palestinian universities and health care colleges to integrate infection control courses, in their academic curricula.
6. Encourage MOH to establish infection surveillance system for both staff and patients.

6.3.3Areas for future research:

1. Conduct further national studies about health care professionals' KAP level on HCAIs and compare with the results of this local study.
2. Assess the infection control systems at Palestinian hospitals, especially those applying for GCI or ISO in order to enhance the prevention outcomes of HCAI.
3. With the current international health crisis of COVID-19 pandemic, it is necessary to conduct further research investigating the impact of COVID-19 prevention protocols on health care professionals' KAP and commitment level.
4. To conduct similar studies at the primary health care centers and outpatient clinics.

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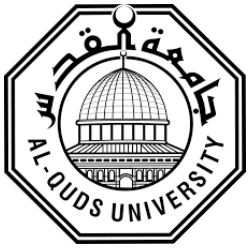
Appendices

Appendix 1: study questionnaire

بسم الله الرحمن الرحيم



جامعة القدس

كلية الدراسات العليا

أعزائي الزملاء الممرضين والممرضات،،،

يقوم الباحث بإعداد دراسة لاستكشاف المعرفة والمواقف والممارسات للممرضين فيما يتعلق بعدوى الرعاية الصحية المكتسبة في مستشفيات محافظة الخليل.

واعد هذا الاستبيان كجزء من دراسة للحصول على درجة الماجستير في الصحة العامة، ولقد تم اختياركم لتكونوا ضمن عينة الدراسة. لذا نضع بين أيديكم هذه الاستبانة راجيين تقديم المساعدة وذلك بالإجابة علىفقرات الاستبانة بدقة وموضوعية لما له اثر كبير في الحصول على نتائج دقيقة. علما أن كل ما يرد في إجاباتكم سيكون موضع احترام، وسوف يعامل بسرية تامة، ولن يستخدم إلا لأغراض البحث العلمي فقط، وعليه لا داعي لكتابة الاسم أو أي معلومات تدل على شخصكم الكريم .

ستحتاج إلى حوالي 15 دقيقة لاستكمال هذا الاستبيان، يرجى قراءة الأسئلة واختيار ما يناسبك باستخدام علامة (X) أو (√) في المكان المناسب.

إن فريق البحث على استعداد لتزويدكم بنتائج هذه الدراسة في حال الطلب

مع الشكر الجزيل لتعاونكم

لمزيد من الاستفسار يمكنكم الاتصال على : 0599339140 أو 0568339143

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الباحث : لؤي سعدي أبو ريان

إشراف الدكتور: حسين الجبارين

الجزء الأول: البيانات الديموغرافية:

يرجى قراءة الأسئلة ووضع علامة على إجابتك باستخدام علامة (X) أو (√) في المكان المناسب.

1. العمر بالسنوات: •25-21 • 30-26 • 35-31
• 36 – 40 • 45-41 • اكثر من 45
2. الجنس: • ذكر • أنثى
3. الحالة الاجتماعية: • أعزب • متزوج • غير ذلك
4. مستوى التعليم: • دبلوم متوسط • بكالوريوس • دبلوم عالي متخصص
• ماجستير • دكتوراه غير ذلك/حدد:.....
5. المنصب الحالي: • ممرض مؤهل • ممرض قانوني • مساعد رئيس قسم
• رئيس قسم • مدير التمريض • غير ذلك/حدد: .....
6. الوضع الوظيفي: • دوام كامل • دوام جزئي •عقد مؤقت • غير ذلك / حدد: .....
7. سنوات الخبرة: • اقل من 5 سنوات • 6-10 • 11-15 • اكثر من 15
8. القسم الذي تعمل به: .....
9. منذ متى وأنت تعمل بالقسم الحالي: •اقل من 2 سنة • 2 - 4 سنوات • 5- 10 سنوات •اكثر من 10 سنوات
10. الراتب الشهري (شيكل): •اقل من 3000 • 3000 -4000 •4000 – 5000 □اكثر من 5000
11. المشاركة في دورات منع انتشار العدوى : • أسبوعيا • شهريا • سنويا •غير ذلك / حدد:
12. اخر دورة شاركت بها : •اقل من سنة • من 1-3 سنوات •من 3-5 سنوات • اكثر مرة 5 سنوات
13. هل يوجد في مؤسستك لجنة مكافحة عدوى: • نعم • لا • لا اعرف
14. متى تم تأسيس هذه اللجنة : • اقل من سنة • من 1-3 سنوات •من3-5 سنوات
• اكثر من 5 سنوات •لا اعرف
15. تقوم لجنة مكافحة العدوى بعمل اجتماع : • أسبوعيا • شهريا • سنويا •غير ذلك / حدد:...
16. ما هو نوع لباسك الطبي : •معطف •زي موحد (بدلة) •الاثنان معا •غير ذلك.....
17. تقوم بغسل لباسك الطبي : • يوميا • مرتين في الأسبوع • ثلاث مرات في الأسبوع
•مرة أسبوعيا •شهريا • ولا مرة

الجزء الثاني:. العبارات في الجدول التالي تهدف الى فحص مدى **معرفتكم** بالعدوى المشفوية، لذا الرجاء الإجابة عن الأسئلة التالية باستخدام علامة (X) أو (√) في المكان الذي يناسبك:

1. الرقم	المعرفة	موافق بشدة	موافق	محايد	معارض	معارض بشدة
.18	العدوى المكتسبة في المستشفيات يمكن أن تنتقل عن طريق المعدات الطبية التي تستخدم للفحوصات الخارجية مثل: السماعات الطبية، المنظار، منظار العين					
.19	العدوى المكتسبة ممكن أن تنتقل من خلال الاجراءات والتدخلات الطبية الخارجية للمريض مثل قياس العلامات الحيوية					
.20	السبب الرئيسي في اكتساب العدوى هو الإجراءات الطبية التي تتعامل مع سوائل الجسم، مثل القسطرة البولية وتركيب الأنابيب الانفية					
.21	يعتبر انتقال العدوى المشفوية من أبرز مضاعفات العمليات الجراحية					
.22	التهابات مجرى الدم قد تحدث نتيجة العدوى المكتسبة بالمستشفيات					
.23	تعتبر الجرثومة المقاومة للمضادات الحيوية من أهم المسببات للعدوى داخل اقسام المستشفى					
.24	عدوى الرعاية الصحية المكتسبة هي عدوى قد يصاب بها مقدمو الرعاية الصحية من قبل المرضى					
.25	ممكن إيقاف نشاط الكائنات الحية الدقيقة باستخدام الماء المقطر					
.26	يعد الاستحمام يوميًا للعاملين في مجال الرعاية الصحية بمثابة إجراء احترازي عالمي لمنع العدوى والسيطرة عليها					
.27	يجب تطبيق الاحتياطات/ المعايير القياسية اللازمة لمنع العدوى او الحد منها لجميع المرضى الذين يتم إدخالهم إلى المستشفى بغض النظر عن التشخيص					
.28	يجب اعتبار جميع الطاقم الطبي والمرضى على أنهم عرضة للخطر والإصابة بالعدوى داخل المستشفيات					
.29	يعتبر غسل ونظافة اليدين خط الدفاع الأول ضد انتقال العدوى المكتسبة في المستشفى					
.30	تعتبر الأيدي هي الطريقة الأكثر شيوعًا لنقل الكائنات الحية الدقيقة وإحداث العدوى المشفوية					
.31	يجب تطبيق بروتوكولات مكافحة العدوى على جميع المرضى المدخلين للمستشفى في كل الأوقات					

الجزء الثالث: العبارات في الجدول التالي تهدف إلى معرفة **مواقف** الكادر الطبي للتقليل والحد من العدوى المشفوية، لذا الرجاء الإجابة عن الأسئلة التالية باستخدام علامة (X) أو (√) في المكان الذي يناسبك:

الرقم	المواقف	موافق بشدة	موافق	محايد	ممعارض	معارض بشدة
.32	يجب علي حضور ورش العمل التدريبية بانتظام حول الوقاية من العدوى ومكافحتها					
.33	من مسؤوليتي أن أندمج مع إرشادات وسياسات العدوى المكتسبة من المستشفيات					
.34	أعتقد أن إتباع الإرشادات الخاصة لمنع العدوى والوقاية منها سيقلل من معدلات الإصابة المكتسبة في المستشفيات					
.35	يجب أن أتبع إرشادات إجراءات مكافحة العدوى في القسم					
.36	في حال عدم توفر غرف كافية لعزل المريض المصاب بالعدوى يمكن وضع المرضى المصابين بأمراض معدية في نفس القسم مع مرضى آخرين					
.37	تنظيف اللباس الرسمي للموظفين يوميًا يساعد في منع العدوى والسيطرة عليها					
.38	إن إحضار الطعام والمشروبات من خارج المستشفى إلى القسم قد يسبب انتشار العدوى داخل المستشفى					
.39	ارتفاع عدد الزوار بشكل دوري يؤدي إلى زيادة احتمال انتقال العدوى داخل المستشفى					
.40	أنا أعرف كيفية الوقاية والسيطرة على العدوى المكتسبة في المستشفى					
.41	يؤثر عبء العمل أو ضغط العمل على القدرة على تطبيق معايير وإرشادات الوقاية من العدوى					
.42	يساعد تحضير الدواء المعقم أو النظيف في غرفة خاصة على تقليل العدوى المكتسبة					
.43	المبادئ التوجيهية للوقاية من العدوى المعمول بها تؤدي إلى تحسين نتائج فحوصات المريض والحفاظ على سلامته					

الجزء الرابع: العبارات في الجدول التالي تهدف الى استكشاف **ممارستكم** لإجراءات مكافحة العدوى المشفوية، لذا الرجاء الإجابة عن الأسئلة التالية باستخدام علامة (X) أو (√) في المكان الذي يناسبك:

الرقم	الممارسة	موافق بشدة	موافق	محايد	معارض	معارض بشدة
.44	أقوم بغسل اليدين قبل وبعد التعامل مع المرضى					
.45	أقوم بفرك اليدين بماده تحتوي على الكحول عند التعامل مع المرضى من أجل الحد من انتشار العدوى					
.46	أقوم بارتداء قناع الوجه عند إجراء أي تدخل طبي مع المرضى					
.47	أقوم بارتداء قفازات طبية عند إجراء أي تدخل طبي والتعامل مع سوائل الجسم					
.48	نعتبر أن استخدام آلة الحلاقة لحلاقة موقع العملية الجراحية في الوقت المناسب من الطرق المهمة لمنع انتشار العدوى					
.49	عند التعامل مع شراشف المرضى يتم ارتداء معدات الحماية الشخصية					
.50	يمنع نفض الشراشف لتخليصها من الغبار قبل إرسالها إلى قسم الغسيل					
.51	في حال ارتداء القفازات لا داعي لغسل الأيدي					
.52	أعتقد أن جميع المرضى في قسمنا يتوقعون مني أن أغسل يدي قبل وبعد التعامل معهم					
.53	وفقًا لمسؤولياتي، لدي ما يكفي من الوقت لتطبيق إرشادات مكافحة العدوى والوقاية منها					
.54	أعتقد أنه يجب إعادة تغطية الإبر بعد الاستخدام وقبل التخلص منها لمنع الوخز منها ونقل العدوى					
.55	في حال عدم توفر القفازات الطبية، يمكنك التصرف والتعامل مع سوائل الجسم مثل الدم أو البول بأيدي عارية					

الجزء الخامس: العبارات في الجدول التالي تهدف إلى معرفة **معايير المؤسسة اللازمة** للتقليل والحد من العدوى المشفوية، لذا الرجاء الإجابة عن الأسئلة التالية باستخدام علامة (X) أو (√) في المكان الذي يناسبك

الرقم	معايير الموسسة	موافق بشدة	موافق	محايد	معارض	معارض بشدة
.56	مدير ومشرفو المستشفى يراقبون مدى معرفة الكوادر الطبية بالوقاية من العدوى والسيطرة عليها					
.57	جميع الكوادر الطبية تشارك في كل عام في دورة تدريبية / ورشة عمل حول الوقاية من العدوى والسيطرة عليها					
.58	تقوم لجنة مكافحة العدوى في المستشفى بمتابعة ومراقبة عمل الكادر الطبي ونتائج فحوصات الزراعة للمرضى					
.59	لجنة مكافحة العدوى هي المسؤولة عن عمل ندوات دورية من أجل زيادة الوعي وتقليل انتشار العدوى					
.60	معايير الوقاية من العدوى والمبادئ التوجيهية ليست مهمة لهذا المستشفى					
.61	هذا المستشفى معد جيدا من ناحية المعرفة والتدريب والتجهيزات اللازمة لمنع تفشي العدوى					
.62	يتم فحص المريض للكشف عن استعمار الكائنات الدقيقة بغض النظر عما إذا كان هناك دليل على الإصابة أم لا					
.63	يتم عمل المسح الدوري لكافة الموظفين داخل المستشفى من أجل التقليل من انتشار العدوى					
.64	يتم توفير التطعيمات المتخصصة دائمًا للطاقم الطبي حول سبل مكافحة العدوى المشفوية					
.65	معدات الحماية الشخصية اللازمة للتعامل مع المرضى متوفرة في المستشفى في جميع الأوقات					
.66	يقوم مدير ومشرفو المستشفى بمراقبة جميع المرضى المتوقع اصابتهم بالعدوى لأخذ الاحتياطات اللازمة لمنع اصابتهم بالعدوى					
.67	يتم تعقيم جميع الأدوات و المعدات الطبية بالكامل في قسم التعقيم					
.68	يتم ابلاغ وزارة الصحة عن بعض أنواع الجراثيم في حال حدوثها					
.69	أرى أن سياسات ومعايير وأنظمة مكافحة العدوى ومنع حدوثها كافية في المستشفى					

Appendix 2: MOH approval

State of Palestine
Ministry of Health - Nablus
General Directorate of Education in Health

دولة فلسطين
وزارة الصحة– نابلس
الإدارة العامة للتعليم الصحي

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

الرقـــم: .... / ١٠١ / ٢٠٢٠
التـاريخ: ..١٤..١..٢٠٢٢

الأخ مدير عام الادارة العامة للمستشفيات المحترم،،،

تحية واحترام،،،

<u>الموضوع: تسهيل مهمة طالب ماجستير</u>

يرجى تسهيل مهمة الطالب: **لؤي ابو ريان– ماجستير صحة عامة– جامعة القدس،** في عمل مشروع التخرج بعنوان: " Assessment of nurses knowledge, attitudes and practices (KAP) of Hospitals' acquired Infections (HACI)"، لذا يرجى تسهيل مهمته من خلال السماح له بتوزيع استبانة البحث على الممرضين والممرضات (بعد اخذ موافقتهم)، وذلك في:

- **مستشفى عاليه**
- **مستشفى المحتسب**
- **مستشفى يطا**
- **مستشفى بيت جالا**

مع العلم ان المشرف على البحث هو د. حسين جبارين.

كما أنه سيتم الالتزام بمعايير البحث العلمي والحفاظ على سرية المعلومات.

مع الاحترام،،،

د. امل ابو عوض
مدير عام التعليم الصحي

نسخة: عميدة كلية الصحة العامة المحترمة/ جامعة القدس

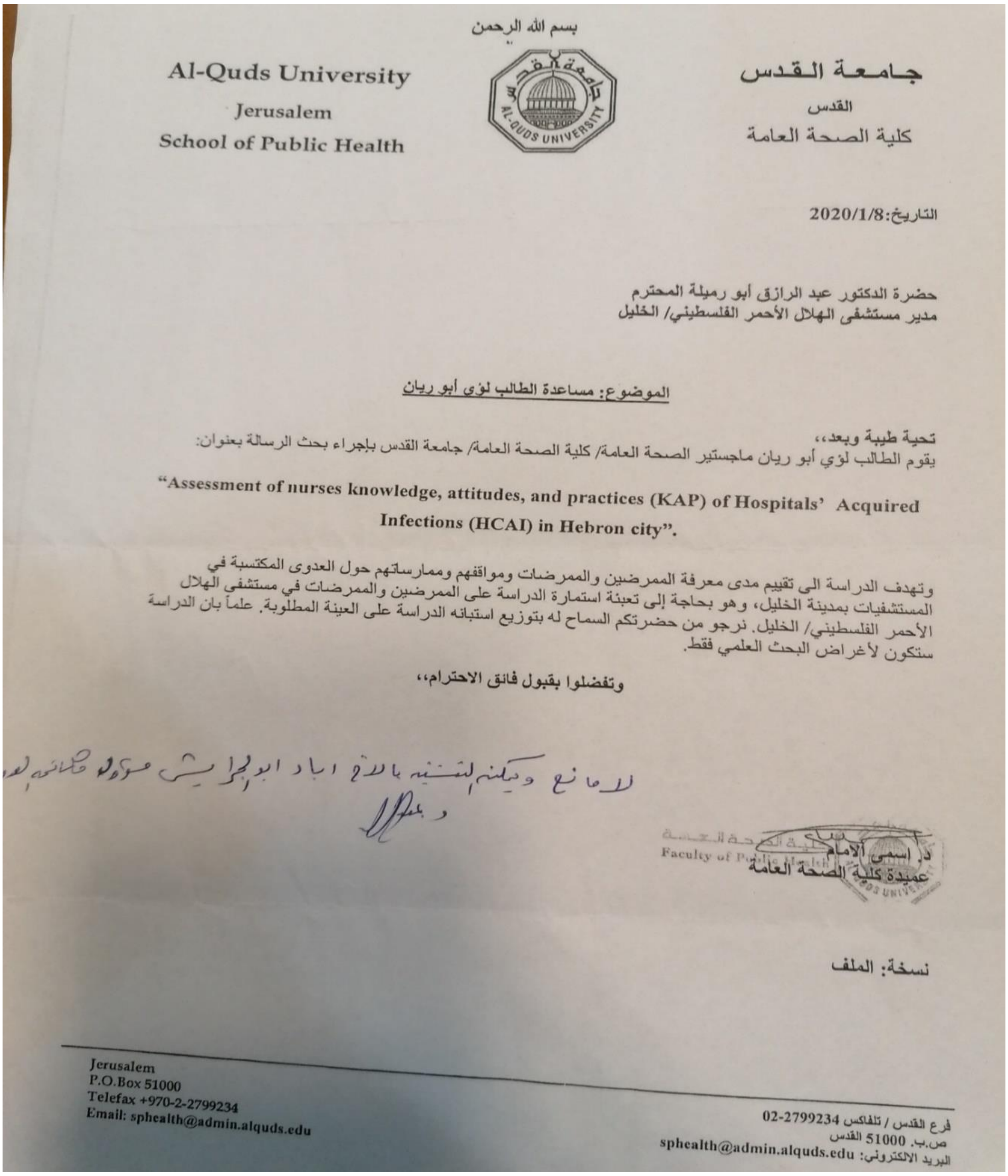
P.O .Box: 14
TelFax: 09-2333901

ص.ب. 14
تلفاكس: 09-2333901

Figure 2: MOH approval.

Appendix 3: NGO& private hospitals approval.

1- Palestinian red crescent hospital (PRCS) – Hebron



بسم الله الرحمن

Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

التاريخ:2020/1/8

حضرة الدكتور عبد الرازق أبو رميلة المحترم
مدير مستشفى الهلال الأحمر الفلسطيني/ الخليل

الموضوع: مساعدة الطالب لؤي أبو ريان

تحية طيبة وبعد،،
يقوم الطالب لؤي أبو ريان ماجستير الصحة العامة/ كلية الصحة العامة/ جامعة القدس بإجراء بحث الرسالة بعنوان:

"Assessment of nurses knowledge, attitudes, and practices (KAP) of Hospitals' Acquired Infections (HCAI) in Hebron city".

وتهدف الدراسة الى تقييم مدى معرفة الممرضين والممرضات ومواقفهم وممارساتهم حول العدوى المكتسبة في المستشفيات بمدينة الخليل، وهو بحاجة إلى تعبئة استمارة الدراسة على الممرضين والممرضات في مستشفى الهلال الأحمر الفلسطيني/ الخليل. نرجو من حضرتكم السماح له بتوزيع استبانه الدراسة على العينة المطلوبة. علماً بان الدراسة ستكون لأغراض البحث العلمي فقط.

وتفضلوا بقبول فائق الاحترام،،

د. اسمى الامام
عميدة كلية الصحة العامة

نسخة: الملف

Jerusalem
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البريد الالكتروني: sphealth@admin.alquds.edu

Figure 3: Palestinian Red Crescent hospital (PRCS) approval.

2- Al-Ahli hospital approval.

سعادة الدكتور يوسف التكروري المحترم
مدير مستشفى الأهلي/ الخليل

الموضوع: مساعدة الطالب لؤي أبو ريان

تحية طيبة وبعد،،
يقوم الطالب لؤي أبو ريان ماجستير الصحة العامة/ كلية الصحة العامة/ جامعة القدس بإجراء بحث الرسالة بعنوان:

"Assessment of nurses knowledge, attitudes, and practices (KAP) of Hospitals' Acquired Infections (HCAI) in Hebron city".

وتهدف الدراسة الى تقويم مدى معرفة الممرضين والممرضات ومواقفهم وممارساتهم حول العدوى المكتسبة في المستشفيات بمدينة الخليل، وهو بحاجة إلى تعبئة استمارة الدراسة على الممرضين والممرضات في مستشفى الأهلي/ الخليل. نرجو من حضرتكم السماح له بتوزيع استبانه الدراسة على العينة المطلوبة. علماً بان الدراسة ستكون لأغراض البحث العلمي فقط.

وتفضلوا بقبول فائق الاحترام،،

د. يوسف عبد الحميد التكروري
المدير العام
مستشفى الأهلي - الخليل

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Figure 4: Al-Ahli hospital approval.

3- Al-Mezan hospital approval

بسم الله الرحمن الرحيم

Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

التاريخ: 2020/7/8

حضرة الدكتور حازم الشلالدة المحترم
مدير مستشفى الميزان التخصصي/ الخليل

الموضوع: مساعدة الطالب لؤي أبو ريان

تحية طيبة وبعد،،

يقوم الطالب لؤي أبو ريان ماجستير الصحة العامة/ كلية الصحة العامة/ جامعة القدس بإجراء بحث الرسالة بعنوان:

"Assessment of nurses knowledge, attitudes, and practices (KAP) of Hospitals' Acquired Infections (HCAI) in Hebron city".

وتهدف الدراسة الى تقييم مدى معرفة الممرضين والممرضات ومواقفهم وممارساتهم حول العدوى المكتسبة في المستشفيات بمدينة الخليل، وهو بحاجة إلى تعبئة استمارة الدراسة على الممرضين والممرضات في مستشفى الميزان التخصصي/ الخليل. نرجو من حضرتكم السماح له بتوزيع استبانه الدراسة على العينة المطلوبة. علماً بان الدراسة ستكون لأغراض البحث العلمي فقط.

وتفضلوا بقبول فائق الاحترام،،

د. اسمى الامام
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Figure 5: Al-Mezan hospital approval.

Appendix 4: List of names & specialties of referees**:**

1- Dr. Faired Graib– Al-Quds university
2- Dr. Maha Nahal – Al-Quds university
3- Dr. Ali Sabaten – Subspecialist infectious disease
4- Dr. Rania Abuseir- Al-Quds university

Appendix 5: List Abbreviations:

- KAP: knowledge, Attitudes, and Practices
- HCAI: Health Care Acquired or Associated Infections
- WHO: World Health Organization
- SD: Stander Deviation
- CDC: Centers for Disease Control
- IPC: Infection Prevention and Control
- COVID-19: Corona Virus Disease 2019
- SARS: Severe Acute Respiratory Syndrome
- MERS: Middle East Respiratory Syndrome
- PPE : Personal Protective Equipment
- PN: Pneumonia
- BSIs: Blood Stream Infections
- UTIs: Urinary Tract Infections
- SSI: surgical Site Infection
- ICU: Intensive Care Units
- NI: Nosocomial Infections
- ESBL: Extended Spectrum β-lactamase.

- NICUs: Neonatal Intensive Care Units
- MOH: Ministry of Health
- HCWs: Health Care Workers
- PMPJ: Palestinian Medical and Pharmaceutical Journal
- SIPs: Standard Isolation Precautions
- SPs: Standard Precautions.
- MDR: Multi-Drug Resistant
- PrEP: Pre-Exposure Prophylaxis.
- HIV: Human Immunodeficiency Virus
- STD: Sexually Transmitted Disease
- NIS: New Israel Shekel
- PMOH: Palestinian Ministry of Health
- PRCS: Palestinian Red Crescent hospital
- PFS: Patient Friends Society
- ANOVA: Analysis Of Variance
- R: Regression
- SPSS: Statistical Package for the Social Sciences
- GCI: Joint Commission International
- ISO: International Standardization Organization.
- I.M: institutional measurements