

**INFECTION CONTROL MANAGEMENT AND
COMPLIANCE AMONG NURSES IN SELECTED
HOSPITALS IN MALAYSIA**

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ABSTRACT

Background: Nurses, as health care professionals, have the duty to ensure that their patients are free from any nosocomial infection that may happen, especially within 48 hours after post-administration in a hospital setting. The importance of knowledge, attitude, and hands-on practices may influence the nurses' compliance towards infection control practices, especially among the Malaysian nurses from selected hospitals, in order to meet the challenges of protecting the patients who are receiving treatments. If these infections are prevented in the clinical environment, it will be able to help the patients with early recovery and obtaining high-quality medical care in the clinical setting. Hence, this study investigated the knowledge, attitudes, skill, and practices towards the compliance of infection control practices at a clinical location among the nurses from selected hospitals, with the aim of achieving the end safety treatment to patients' care.

Method: The study was conducted by involving nurses from selected local government and private hospitals. The study used a cross-sectional and survey questionnaire that analyzed factors related to knowledge, attitude, and practices. A total of 400 samples were obtained with stratified random sampling that focused on nurses who are practicing in Malaysian hospitals. Next, data analyses were done by using mean and standard deviations, followed by analysis with One-way ANOVA to test the hypotheses at <0.05 levels of significance respectively through the use of the Statistical Package for Social Science (SPSS) version 22.0.

Results: The main study population ($n=400$) was distributed with the questionnaires. Out of the 400 questionnaires distributed, 359 were returned with completed finding, hence 1% of the study population did not response to the survey. The results showed that 66.7% of the selected nurses had high knowledge in infection control practices, while 58% of them were positive toward the implementation of infection control practices. Gender ($p=0.016$) and the years of clinical working experiences ($p=0.001$) were found to significantly influenced attitudes. These findings indicated that there is knowledge, attitude and practice gap influences among Malaysian nurses. The results showed that the nurses in the selected hospitals demonstrated a moderate level of intention to work, with significant mean difference (mean diff=-0.287, $p<0.05$) was detected between the 21 to 25 years old and over 30 years old responses.

Conclusion: Throughout the study finding, a state-wide survey was utilized to measure the IPC practice compliance among Malaysian nurses from the selected hospitals. These nurses were determined to be insufficiently performing in knowledge attitude towards compliance in infection control practices. The non-compliance skill practices among these Malaysian nurses may lead to infection breakdown, thus affecting patient safety in the hospital setting.

Keywords: *Knowledge, Attitudes, Belief, Skill Practices, Compliance, Infection Prevention Control.*

APPROVAL

This is to certify that this thesis conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, for the fulfilment of the requirements for the degree of Doctor of Philosophy

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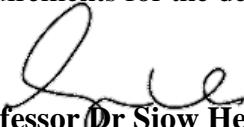
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13 June 2022

DECLARATION

I hereby declare that the thesis submitted in fulfilment of the PhD degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the programme and/or exclusion from the award of the degree.

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Signature of Candidate:  . -

Date: 16 February 2022

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Praise Allah, the Almighty, for his guidance and direction throughout my life. “Allah is my light, my fortress, and my shield; whom shall I fear?”

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I dedicate this thesis to my late father, may bless his spirit rest in peace; to my beloved mother grant her long life a been encouraging and critical, and have stood beside me in this life’s journey. Thank you.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
AeU	Asia e University
CDC	Centre for Disease control
HAI	Hospital Acquirer Infection
IPC	Infection Prevention Control
IC	Infection Control
ICUs	Intensive Care Units
KFC	Kentucky Fried Chicken
MOH	Ministry of Health
MREC	Medical Research & Ethic Committee
NIs	Nosocomial Infection.
NACNS	National Association of Clinical Nurse Specialty
NPE	Nursing Practice Environment
SARS	Severe Acute Respiratory Syndrome
WHO	World Health Organisation
THBM	Theory Health Belief Model
TPB	Theory Planned Behaviour

CHAPTER 1.0 INTRODUCTION

1.0 Introduction

Nosocomial infections can be influenced by a patient or infection from the nurses, as a more influenced by serious problem human error in the hospital settings. The compliant weakness of infection control practices is shown to lead to nosocomial infection in the clinical setting. Therefore, it is important to understand the factors that affect the nurses' compliance when handling infection control practices. The nosocomial breakdown is shown to induce economic stress and impact nursing management towards patients in hospital settings. So, prevention is essential to ensure that the Malaysian nurses in hospitals can effectively provide the greatest level of patient care safety. The importance of an organization is to measure the effectiveness of nurses' compliance in issues related to infection control practices. The maintenance of standard precaution may influence the compliance to maintain quality care for the patients and, on the safe side, to avoid future nosocomial infection. The Ministry of Health and Family Welfare (2015) has kindled interest among the hospital administrators to strengthen their policies by setting up systems, protocols, and dedicated funds, as these would result in some perceivable improvements in standard guidelines and documentation. However, this situation may be changed due to the unpredictable environment that is influencing the nursing practices within 21st century, including the Malaysian nurses' compliance in infection practice control that consequently influence their safety treatment to the patients. The effective practices among nurses' knowledge, attitude, belief, and skill may affect the safety practices and health care experiences on patient's care. Besides that, it is important to explore compliance infection prevention practices among Malaysian nurses in hospital settings.

The thesis describes and explains infection control practice compliance among Malaysian nurses in the selected hospitals. The study aimed to measure the gaps in knowledge, attitudes, skill, and practices in infection prevention practice compliance among nurses in clinical settings. The study reports aimed to evaluate and fill the identified gaps in knowledge, attitudes, skill, and practice infection prevention practice compliance, as a way to control nosocomial infection breakdown. Furthermore, knowledge, attitudes, skill, and practice are important among the nurses to enhance infection prevention control practices in their clinical settings. So it is essential to explore the compliance of infection prevention control practice among nurses in the selected hospitals. The theories' relationship and components of knowledge, attitudes, skill, and practices are influencing infection prevention practices to control future nosocomial infection breakdown in the hospital settings.

1.1 Background of the Study

Nosocomial infection or hospital-acquired infection usually occurred within 48 hrs or 72 hrs of admissions and are the challenging issues faced by hospitals in all over countries, including Malaysia. Staff nurses are playing an important role in reducing infection by following the compliance to infection prevention control practices in order to reduce nosocomial transmission infection from selected hospitals in Malaysia. The infection prevention control is counterpart to compliance among Malaysian nurses towards efficiency to prevent future nosocomial infection in the clinical settings. The present research study was conducted with listed understanding of the compliance in infection prevention practices towards the prospects of knowledge, attitude, skill, and practice among Malaysian nurses in the selected hospitals.

The issues highlighted among Malaysian nurses in the clinical settings including facing difficult situation when treating the patients. This has influenced their mild compliance practices in dealing with infection prevention caused by nosocomial infection breakdown. The issues of Malaysian nurses involve facing various difficulties in managing infection practice control, as this influenced their awareness towards controlling nosocomial breakdown. Nosocomial infection is also known as hospital-acquired infections. It influences the clinical field and increases economic costs through impacting the length of hospitalization stay and prognosis among the patients in hospital (World Health Organization, 2015). Hospital-acquired infection influences the patients when they are in the hospital compound and affects treatment in the ward or carrier before they are being admitted to the hospitals within 48 hours. The hospital-acquired infection-influenced morbidity and mortality influence the infection practice control. Therefore, it is crucial to acquire effective strategies of compliance among nurses throughout their knowledge, attitudes, practice, and skill in their practices. In terms of safety environment, the shortage of staffs among nurses shows the importance of compliance and strong leadership to handle safety practices through taking care of the patients in a hospital setting. The nurses need to be enhanced with the mediators of knowledge, attitudes, skill in their standard infection practices control with compliance mandate.

The possible factors that influence the nurses' practices towards infection practice control include the age, experiences, and knowledge among Malaysian nurses. The nurses' practices are co-related between knowledge and level of qualification. The previous study showed a significant statistical difference in knowledge and non-significant difference was found in practice scores. Malaysia's human resources for health levels are similar to those from the other upper-middle-income countries, where

doctor and nurse to population ratios are 1:656 and 1:305, respectively (Ministry of Health, 2016). Malaysia's health system also provided significant improvements in increasing the status of health in the country, especially to ensure infection control practice compliance among healthcare workers, including nursing staffs' compliance with the standard policies on infection control practice. The challenges are crucial to a nursing career to ensure the success of prevention in infection control practice, as these improve and reduce the infection breakdown in the healthcare setting. The studies discussed and stated that knowledge level in infection control practice would influence the nurses and generate a safety practice treatment to the patients in the healthcare setting.

The clinical setting environment is also influenced by their belief and perception in organizing their treatment towards patient's safety and works culture that demand the infection control practices. According to Shah *et al.* (2015), most of the respondents are aware of infection control practice, but due to workload and demand, the progress of practice in the clinical settings is inhibited. HAIs have been steadily decreased recently, but 1% of every 25 hospitalized patients each year still experience hospital-acquired infections (Korea Centre for Disease Control, 2018). The hospital administration should have a very important role in improving infection prevention control practice and must be able to maintain a good quality nursing care and valuable safety, in addition to cutting the cost of financing for length of stay in the hospitals. The nurses can cause the breakdown of infection when the IPC practices are not being appropriately performed in the clinical area. Besides that, self-awareness is part of the mediator to influence their behavior and compliance with safety practices of infection control practices, as well as controlling finances in the hospital settings.

The findings of World Health Organization (2016) found that there is a gap in the knowledge among nurses, especially in the implementation of standard practice in infection control practices. The gap showed poor resource practice in healthcare settings and the resulted consequences. According to World Health Organization (2016), infection breakdown is found in every event of hospitalization and influences the health care setting worldwide due to poor knowledge practice, thus actions are needed to break the event. The studies discussed and determined that knowledge level in infection control practices would influence the nurses to generate a safety practice treatment to the patients in the healthcare setting, even though these nursing staffs have been provided with guidelines for infection prevention control (IPC) practices to help them to comply with proper protocols. The assessment areas of infection prevention practices influence their improvement and also their knowledge level, as a part of the nurses' professional development related to patient care in the healthcare setting. The nurse must have knowledge regarding specific practices of infection control, but the most important part is for the nurses to be able to interlink their knowledge on infection prevention control by using critical thinking with expected outcomes and by performing standard policies of IPC in the patients care delivery. The progress of nursing practice is important for nursing staffs in order to facilitate their education by performing training programs on infection prevention practices.

The factors, in terms of belief, non-compliance motivation and work demand influence infection control practice that may lead to the infection breakdown in the clinical setting. Smiddy *et al.* (2015) performed a systematic literature review among clinical practices towards hand hygiene practices, mainly in the clinicians' compliance with hand hygiene. The researcher found that there are two major identified sources that lead to motivation and workforce demands, and subsequently influence the

infection control practices. The belief to perform infection control practices is influenced by organizational factors, such as management setting and peer support to practice and prevent infection. Besides that, the modelling role by senior nurses on the priority of the patients' care treatment is also crucial. The clinical setting environment also influences their belief and perception in organizing their treatments towards patient's safety and works culture that demand infection control practices.

1.2 Problem Statement

Infection-related to the disease process was the main reason non-compliance happened in Malaysian hospitals and involved among nurses in their skill practice to compliance towards infection practice control in the clinical setting. Among Malaysian nurses who have not been inadequate with knowledge, non-compliance in infection prevention control leads to safety towards the patient. The government has highlighted the importance of infection, especially in Malaysia hospitals, to prevent future pandemics as stated by European Centre for Disease Prevention and Control (2014); the high risk of nosocomial infection influences public health neighboring countries, and therefore important to educate and prepare our nurses in compliance of standard infection prevention control should be stabilized for safety side. The effectiveness of among Malaysian nurses' compliance on knowledge, attitude, skill, and efficiency of practice in infection practice control needed in the hospital.

The prevalence showed patient safety had exposure due to nosocomial infection. Therefore, the influence majority of Malaysian nurses' practice included the ability to facilitate patient safety throughout infection practice control, including knowledge, attitude, and practice in the clinical setting. Among nurses, the ability to comply with practice towards patient safety is being influenced through exposure to hospital-acquired infections. The majority of the health care professionals are nurses,

and therefore, nurses have the ability to facilitate patient safety care through infection prevention and control knowledge, attitude, and practice in hospitals, Benson and Powers, (2017). However, compliance with infection prevention control practices has been evaluated mainly only in nurses, no involvement in nursing students, non-compliance has been a constant problem, Quan *et al.* (2015). The nosocomial infection leading to high significant prevalence influenced Hospital Associated Infections (HAIs) have been associated with significant morbidity and attributable mortality, as well as greatly increased health management and cost in the clinical setting. The nosocomial infection was important to influence in the clinical field, depending on systemic or localized affected in different ways throughout medical equipment and the human body throughout the human error.

It is important to evaluate knowledge, attitudes, skill, and practice towards infection practice control in the clinical settings to improve the quality of knowledge, attitudes, skill, and practices among nurses. As mentioned in the education and training of IPC practices, it is important to assess the knowledge level and compliance with infection control practices to prevent future transmission (AL-Rawajfah and Tubaishat, 2017).

The importance of nurses in transforming the health care setting and the application of infection prevention control include to have adequate knowledge about standard practice infection control. The role of nurses with proper practice infection control standards may influences the quality of health care towards patients on the safe side.

Sessa *et al.* (2017) discussed the level of knowledge, attitudes, and practices regarding disinfection procedures among nurses in Italian hospitals. The study found the level of knowledge in infection control practice based on the survey was not

satisfactory, and prevalence showed among nurses' percentage influenced nosocomial breakdown. The survey assessed the level of knowledge of the breakdown of nosocomial infection. The survey found the level of knowledge particularly influences the breakdown of hospital-acquired infections, results were unsatisfactory, and a small percentage of nurses reported their performance appropriately in their practical activities. The awareness of the positive attitude will help extremely control nosocomial infection and patient safety in the clinical setting. Sessa *et al.* (2017) Recommended hospital-acquired infection able to control education and training programs to prevent future nosocomial breakdown and improve knowledge toward procedure skills to address important management as essential strategies in patient safety and reduction of nosocomial infection.

The study showed positive influence effects on nurses' education level and health care organization administration by providing data to generate well planning improvement in knowledge, belief and skill to be safe work environment including new educational training to generate a better decision-making training and their practice environments. The opportunities of knowledge level showed in a few studies have evaluated compliance with infection control practice among nurses in competency in clinical practice (Gould, 2017). There are no studies evaluating occupational exposure as a factor affecting compliance with infection prevention control. The study evaluated compliance among nurses in infection prevention control in the clinical setting relates to novice and experienced nursing staff. The objectives are to measure the inter relationship between occupational exposure, safety environment, attitude toward knowledge, and compliance in infection prevention control. This study will evaluate compliance improvement efforts among Malaysian nurses in the clinical setting.

1.3 Research Questions

The following research questions are formulated to gather the selected and required data:

- i. Does registered nurses' current knowledge level and skills regarding infection prevention control affect their preventive control practices (PCP)?
- ii. Does the correlation among nurses' beliefs concerning the importance of appropriate infection prevention and affect their PCP?
- iii. Do the association between nurse's attitudes affect the PCP of nurses according to the hospitals' protocols?
- iv. Is there an associative between nurses' compliance to IPC practices in hospitals?

1.4 Research Objectives

This study aims to assess the knowledge, attitudes, skill, belief, practice, and compliance in infection practice control among nurses in selected Malaysian hospitals.

Below are the research objectives of this study:

- i. To investigate the effects of knowledge and skills of staff nurses on infection prevention and control practices.
- ii. To determine any correlation among nurses' attitudes concerning the importance and impacts of IPC practices in the care of patients.
- iii. To determine the association between the organization and nurses' compliance or non-compliance in IPC policies.
- iv. Discover the significant factors that influence nurses' belief from adhering to the IPC practices and control protocols in the hospital.

1.5 Justifications and Significance of the Study

The aim of this study is to assess the knowledge, attitudes, skill, belief, practice, and compliance level in infection practice control through evaluating and identifying infection control practices and compliance among Malaysian nurses in the selected hospitals. In the process of improving quality practices and management in standard IPC, the nurses are facing challenges to control nosocomial infection breakdown. There are challenges that happen, especially the dynamics of change that may lead to safety practices in infection practices control. The research evaluates the understanding of compliance in infection control practices among Malaysian nurses. The exploring of data collection about infection control practice is performed among selected population of nurses in the selected Malaysian hospitals.

The clinical setting with compliance in infection control practices, as stated by Quan *et al.* (2015), involves the best strategy in preventing occupational exposure among nurses. This is acknowledged by the compliance with IPC practices, such as standard precaution. The research highlighted the importance of safety practices and infection control practices in the patient safety among nurses' compliance in measuring their effectiveness of safety skills in the clinical setting. It is important to highlight the compliance of infection control practices to prevent nosocomial infection among Malaysian nurses in the clinical setting.

In order to explore the compliance of infection control practices in nursing practice and management, the survey is planned to measure the level of knowledge, attitudes, skill, belief, practices, and compliance. Particularly, the most common hospital-acquired infections were found to be on average satisfactory, and a small percentage of nurses reported appropriate ways in performing the infection prevention control practices in their practical activities in the selected hospitals in Malaysia.

Hence, the aim of this research study is to explore, describe and analyze data throughout the selected hospitals in Malaysia. The process helps to improve compliance among nurses in the hospital settings and administration. The process of infection prevention control practice and compliance is crucial to reduce the number of infection breakdowns in the healthcare setting.

In conclusion, the overview of positive compliance and belief towards effective infection control practice in health care setting is important to determine appropriate infection control practice, as it influences the personal belief among nurses to generate the practices and to control infection breakdown. The management should also ensure that the nurses have good practices in infection control training that follows guidelines in standard precautions.

1.6 Definition of Operational Terms (relate to conceptual framework)

Definitions for the operational terms used in this thesis are as shown below:

Infection control Practice As stated by the Centre for Disease Control (2014), infection control practice is the basic practice guidelines for the prevention of infection involved in the clinical setting. The practices include the standard precautions listed under Centre Control Disease guidelines and aim to control the practice and prevention of nosocomial infection breakdown. For infection control practices, the guidelines have been used in all clinical areas. It is important for patient safety care treatment.

Nosocomial infection World Health Organization (2017) stated that nosocomial infection usually happens within 48 hrs

from when the patient is admitted to the hospital or by the skill practice of nurses that leads to exposures of infection towards the patient. As such, the compliance is important to ensure the safety of the patients and also healthcare workers in clinical services. The nosocomial infection normally leads to a rise in the cases of morbidity and mortality.

Health Care setting

Malaysia's healthcare services are structured into a two-tier health system, namely public and private healthcare systems. The public health system of Malaysia emphasizes on primary health care and has a referral system to ensure that the standard of policies infection control practice system is being applied to all healthcare workers, especially nurses, in order to have appropriate access to deal with appropriate patient cares in healthcare settings. The government plans to achieve safety prevention toward infection control practices and quality care to patients. The public sector delivery system subsidizes nearly 95% of the patients' cost of treatment for nearly 90% of the population to have access to some forms of cares, (Ministry of Health, 2017).

Knowledge in IPC

The study of Orgaina *et al.* (2015) investigated the understanding knowledge of infection control practices towards its interpretation and application,