



UNIVERSITI PUTRA MALAYSIA

***EFFECTIVENESS OF INTERPROFESSIONAL SIMULATION SCENARIO
ON KNOWLEDGE, ATTITUDE AND PRACTICE OF HOSPITAL-
ACQUIRED INFECTION CONTROL AMONG HEALTH PROFESSIONALS
IN THE KLANG VALLEY, MALAYSIA***

T. SARASWATHY THANGARJOO

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By

T.SARASWATHY THANGARJOO

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

April 2022

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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April 2022

Chairman : Professor Syafinaz binti Amin-Nordin, MBChB, MPath, MHED
Faculty : Medicine and Health Sciences

Interprofessional learning (IPL) is a key challenge in Malaysia in incorporating the approach into the current profession-specific healthcare training and service. Safe practices would be enhanced with improved collaboration among the health professionals (HPs) when they learn with, from, and about each other. This study evaluated the effectiveness of an innovative approach using interprofessional simulation scenarios (IPSS) in improving knowledge, attitude, and practice (KAP) of hospital-acquired infection control (HAIC) among HPs. The quasi-experimental pre-post test study was conducted in a teaching hospital in Malaysia. Purposive sampling was used to recruit participants from surgical, intensive care, and other units due to constraints in getting participants to attend intervention. Thirty-six health professionals in the experimental and forty in the control group completed the study. All subjects participated in an interactive lecture and demonstrated four IPSS on HAIC (i) taking blood specimen (ii) bedside dressing (iii) collecting sputum for acid-fast bacilli and (iv) intermittent bladder-catheterization. Each team consisted of a doctor and a nurse. A self-administered questionnaire consists of three sections namely i) demography details ii) University of West England Interprofessional (UWEIP) questionnaire with four interprofessional aspects (IP) namely, self-assessment on communication and teamwork skills (CTW), attitude on IPL and interprofessional relationship (IPR) and, perception towards interprofessional interaction (IPI) iii) KAP on HAIC was completed by participants in the pre, immediately and post-intervention timelines. The mean score differences between pre-and post-intervention within groups were tested by employing parametric and non-parametric tests eg., paired sample t-test and, between experimental vs control groups with independence t-test for normally distributed variables. The non-normally distributed data was tested with Wilcoxon signed-rank and Mann-Whitney test respectively. Repeated ANOVA measures were conducted to determine the effectiveness of intervention in the experimental group on the three timelines of data collection. The experimental group showed higher positive scores in post-intervention

vs control in the four IPL aspects dimensions and also improved in the KAP scores in HAIC. In CTW, there was no significant difference revealed between post-intervention of the experimental group and post-control group with $p > 0.05$. In IPL dimension, there was a significant difference between the post-intervention and control groups with, $p < 0.05$. Similarly, in attitude dimension in HAIC, there was also no significant difference between the post-intervention in experimental and post-control groups with $p > 0.05$. In IPL aspects there was a significant effect for timeline in pairwise comparison with, Wilks' Lambda=0.776, $F(1, 35) = 4.911$, $p < 0.05$) with $\eta^2 = 0.224$. Likewise in HAIC aspects overall there was a significant effect for timeline, Wilks' Lambda= 21.910, $F(1, 35) = 21.910$, $p < 0.05$) with $\eta^2 = 0.563$. Infusion of a structured IPL approach and a well-designed IPSSHAIC can be effective in improving KAP in HAIC among health professionals.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**KEBERKESANAN PENDEKATAN PEMBELAJARAN
INTERPROFESSIONAL DALAM PENGETAHUAN, SIKAP DAN AMALAN
KAWALAN JANGKATAN HOSPITAL DIKALANGAN PROFESSIONAL
KESIHATAN DI LEMBAH KLANG , MALAYSIA**

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Pendekatan pembelajaran Interprofessional (IPL) ialah cabaran utama di Malaysia dalam mengimplikasikan pendekatan pembelajaran IPL ke dalam latihan dan perkhidmatan kesihatan yang sekarang adalah bersifat spesifik pada kursus profesion secara berasingan. Amalan selamat akan dipertingkatkan dengan kerjasama yang lebih baik di kalangan profesional perkhidmatan kesihatan apabila mereka belajar dengan, daripada, dan tentang satu sama lain. Kajian ini menilai keberkesanan pendekatan inovatif IPL menggunakan simulasi senario antara profesional (IPSS) dalam meningkatkan pengetahuan, sikap dan amalan (KAP) kawalan jangkitan yang diperolehi di hospital (HAIC) dalam kalangan profesional perkhidmatan kesihatan. Kajian eksperimen kuasi pra dan pos ujian dijalankan di sebuah hospital pengajar di Malaysia. Persampelan *purposive* digunakan untuk merekrut peserta daripada unit pembedahan, rawatan rapi dan lain-lain. Tiga puluh enam profesional kesihatan dalam kumpulan eksperimen dan empat puluh dalam kumpulan kawal menyempurnakan kajian. Semua subjek mengambil bahagian dalam kuliah interaktif dan menunjukkan empat IPSS mengenai HAIC (i) pengambilan spesimen darah (ii) pembalut luka (iii) pengumpulan kahak untuk *acid-fast bacilli* dan (iv) pengkateteran intemitan pundi kencing. Setiap pasukan terdiri daripada seorang doktor dan seorang jururawat. Soal selidik yang dijawab sendiri mengandungi tiga bahagian iaitu i) butiran demografi ii) soal selidik University of West England Interprofessional (UWEIP) dengan empat aspek interprofessional (IP) iaitu, penilaian sendiri terhadap kemahiran komunikasi dan kerja berpasukan (CTW), sikap terhadap IPL dan hubungan antara profesional (IPR) dan, persepsi terhadap interaksi antara profesional (IPI) iii) KAP mengenai kawalan jangkitan hospital (HAIC) telah dijawab oleh peserta masa pra, serta-merta dan selepas intervensi. Perbezaan skor min antara ketiga-tiga poin pengumpulan data intervensi telah diuji dengan menggunakan ujian parametrik dan bukan parametrik. Contohnya, untuk taburan data yang normal paired sample t-test diantara kumpulan yang sama dan, *independent t-test* untuk ujian diantara kumpulan eksperimen vs kawalan. Data yang tidak normal telah diuji dengan

ujian Wilcoxon dan Mann-Whitney secara berikutnya. *Repeated ANOVA measures* telah digunakan untuk menentukan keberkesanan intervensi dalam kumpulan eksperimen pada tiga poin pengumpulan data. Kumpulan eksperimen menunjukkan skor positif yang lebih tinggi dalam intervensi vs kawalan dalam empat dimensi aspek IPL dan juga bertambah baik dalam skor KAP dalam HAIC. Dalam CTW, tidak terdapat perbezaan yang signifikan antara selepas intervensi kumpulan eksperimen dan kawalan diakhir intervensi dengan $p > 0.05$. Dalam dimensi IPL, terdapat perbezaan yang signifikan antara kumpulan selepas intervensi dan kawalan dengan, $p < 0.05$. Begitu juga dalam dimensi sikap dalam HAIC, juga tidak terdapat perbezaan yang signifikan antara selepas intervensi dalam kumpulan eksperimen dan kawalan dengan $p > 0.05$. Dalam aspek IPL terdapat kesan yang signifikan diantara kumpulan eksperimen dengan menggunakan *pairwise comparison* dengan, Wilks' Lambda=0.776, $F(1, 35) = 4.911$, $p < 0.05$ dengan $\eta^2 = 0.224$. Begitu juga dalam aspek HAIC secara keseluruhan terdapat kesan yang signifikan untuk kumpulan eksperimen, Wilks' Lambda= 21.910, $F(1, 35) = 21.910$, $p < 0.05$ dengan $\eta^2 = 0.563$. Penyerapan pendekatan IPL berstruktur dan IPSSHAIC yang dirancang dengan baik boleh berkesan dalam meningkatkan KAP dalam HAIC di kalangan profesional kesihatan.

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LIST OF ABBREVIATIONS

AMR	Antimicrobial resistance (AMR) (WHO,2019)
CAIPE	The (UK) Centre for the Advancement of Interprofessional Education
CDC	Centers for Disease Control
CINAHL	Cumulative Index of Nursing and Allied Health
CI	Confidence Interval
CTW	Communication and Teamwork
HAI	Hospital Acquired Infection
HAIC	Hospital Acquired Infection Control
HPs	Health professionals
HCW	Healthcare workers
IP	Interprofessional
ICU	Intensive Care Unit
IOM	Institute Of Medicine
IPEC	Interprofessional Education Collaborative (IPEC)
IPCP	Interprofessional collaborative practice
HICPAC	Healthcare Infection Control Practices Advisory Committee
IPSS	Interprofessional simulation scenarios
IPSSHAIC	Interprofessional Simulated Scenario on Hospital Acquired Infection Control
MMC	Malaysian Medical Council
STROBE	STrengthening the Reporting of OBservational studies in Epidemiology
UWEIP	University of West England Interprofessional
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Introduction

The arising worldwide interest of “Learning together to work together for Health’ (1988) demands interprofessional learning (IPL) drive in Malaysian healthcare education and service. Interprofessional Education (IPE): Occasions when members or students of two or more professions learn about, with and from each other, to improve collaboration, and the quality of care and services (CAIPE, 2019).

Interprofessional collaboration brings multiple health professions (HPs) together at some point to provide team-based patient care (Dent et al., 2013). In 2011, the Interprofessional Education Collaborative Experts Panel (IPEC) established four IPL core competency domains eg., ethics and values for interprofessional (IP) practice, roles, and responsibilities, IP communication and teams, and teamwork.

Interprofessional learning was found applicable in certain subjects of healthcare education and services eg., hospital-acquired infection control (HAIC) practices. The HAIC is a patient safety concern that requires HPs to learn with, from, and about one another to standardize collaborative practices across all disciplines in healthcare. Hospital-acquired infections (HAIs), also known as ‘Nosocomial infections’ or ‘healthcare-associated infections’, are infections “that occur more than hours after admission.” However, different infections have dissimilar incubation periods so that each incidence must be assessed independently to determine the connection between its manifestation and hospitalization” (MOH, 2019).

The Ministry of Health (MOH) Malaysia has established HAIC policies and procedures eg., standard precautions, transmission-based practices and handling of sharps. Various infection control campaigns such as handwashing implemented in Malaysia (MOH, 2010). However, the occurrences of HAIs eg., methicillin-resistance *Staphylococcus Aureus* (MRSA), injuries related to sharps, and needle prick among healthcare workers (HCWs) are still been reported in Malaysia.

Health professionals (HPs) are exposed to hazards of spread of blood-borne pathogens eg., hepatitis B due to needle stick injuries (NSIs). The prevalence of NSIs is more among junior doctors compared with specialists and nurses. It was also found statistically significant in orthopedic wards. The prevalence rate was 32 (20.9%) and the majority of it occurred during assisting in operation theatre 13 (37.4%). Six (18.8%) of them were specialists, 12 (37.5%) medical officers, 10 (31.2%) house officers, and four nurses

(12.5%). Only 148 (96.7%) HPs were aware of the universal precaution (Bhardwaj et al., 2014).

Furthermore, another issue of concern in healthcare education is providing learning opportunities in clinical skills without causing any harm to real patients. In 1990, Miller stated four levels in achieving competency in clinical skills eg., know, knows how, shows how, and does. 'Does' is the phase of learning related to the highest level of competency (Miller, 1990). In clinical practice, identifying the gap between 'knowing and doing' is vital to ascertain skills that could be improved continuously. Simulation provides effective skills training without causing any injuries both physically and emotionally to patients. These opportunity closely adhere to level 4 of Miller's pyramid eg., what the HP does in an actual situation (Flanagan et al., 2004).

Simulation offers guided experiences that emulate momentous authentic clinical environment in a wholly collaborative method (Gaba, 2007). Procedures can be re-enacted using simulation preceding to the actual clinical placement of HCWs. It also enables facilitators to instruct corrections in performing procedures and contribute in striving for a 'zero error' to patients as stated in the 'To Err Is Human' report (IOM, 2000).

Moreover, patients are cared for by HPs with different training and professions in silo models to address a specific problem. They need to collaborate to provide patient-centered care with effective communication patterns and teamwork. The combination of IPL, infection control skills, and the simulation was found effective in improving HAIC and enhancing IPL teamwork (Luctkar-Flude et al., 2016).

New initiatives are mandatory to improve the current HAIC measures collaboratively. This study has incorporated IPL using simulated scenarios approach in HAIs (PSSSHAIC) as an intervention and examined the effectiveness of HAIC practices among HPs.

1.2 Problem Statement

As the demand for greater collaboration among HPs continues to raise, Malaysia is still in the infancy stage in implementing IPL. Previous studies showed health professional courses globally, had incorporated innovative practicum courses with a focus on IPL collaboration. Moreover, in spite of the growth in IPL, there is only a scanty number of works of literature found in Malaysia. In fact, Jalina Karim et al., (2014), suggested IPL be introduced in the early stage of professional training to create an understanding of the roles and responsibilities of other HPs, and formal opportunities to work collaboratively.

Incorporating IPL into healthcare service is essential to ensure safe patient-centered care (Nisbeth et al., 2008), and requires IP teamwork (Gerteis et al., 2002). Furthermore, HPs in clinical areas are role models engaged in IP collaborations. Their variable qualities on the IPL approach create concerns as they may impact the competencies that future HPs might learn from them (Pollard & 2008). Moreover, HPs are trained in different training programs in terms of scheduling, assessment knowledge bases, and skill development for their specific professional roles (Pollard et al., 2005). Other potential challenges in implementing IPL are perceived academic elitism and stereotyping, dominant culture of medical doctors, loss of status, and professional identity. There were also concerns regarding dilution of the role of individual professions in patient care, with the blurring of job boundaries (Lutkar-Flude et al., 2016).

Implementation of IPL requires curriculum change champions to grasp opportunities and lead change to achieve reliable IPL. Challenges are seen as the authorities preferred 'grassroots' change but the junior staff looked to their seniors to mandate a change to address the IPL approach (O'Keefe & Ward, 2018). The integrated IP curricula involve major curriculum restructuring, and preparedness on the part of HPs to reconsider their professional identities (Grace, 2020).

On the other hand, building IPL skills is in line with WHO's recommendation in curbing HAIs incidences. The current HPs in the studied hospital were trained in HAI practices in the silo during their training period. Implications concerning the risks of HAIs have created challenges for healthcare facilities to propose effective infection control measures (Carayon, et al., 2013). Transmission of pathogens through HCWs hands, equipment, supplies, and unhygienic practices (Gichuhi et al., 2015), require effective usage of personal protective equipment (PPE). Failure to observe with HAIC policies and procedures is a complex problem that may be a contributing factor to the rising trend of HAIs globally (Abubakar et al., 2015).

In 2019, the WHO reinforced on safe healthcare and reducing antimicrobial resistance (AMR) to avoid HAIs among patients, HPs and visitors. The Ministry of Health, Malaysia (MOH) has established HAIC policies and procedures eg., standard precautions, transmission-based practices in Malaysian hospitals. However, the occurrences of HAIs eg., methicillin-resistance *Staphylococcus Aureus* (MRSA), injuries related to sharps, and needle prick among HPs are still been reported in Malaysia.

The prevalence of NSIs is more among junior doctors compared with specialists and nurses and it was statistically significant in orthopedic wards. The prevalence rate was 32 (20.9%) and the majority of it occurred during assisting in operation theatre 13 (37.4%). Six (18.8%) of the staff were specialists, 12(37.5%) medical officers, 10 (31.2%) house officers and four nurses (12.5%). Only 148 (96.7%) participants knew the universal precaution (Bhardwaj, et al., 2014).

The possibilities of HPs to continue their practices as learned during their training is a concern. A previous literature from the studied hospital showed, a high percentage of medical trainees having wrong perception, poor knowledge, and inappropriate attitude toward NSIs, and inappropriate handling of needles leading to poor compliance rate to standard precautions (Muhammad Hanafiah et al., 2015).

Another Malaysian study on the effective usage of personal protective equipment (PPE) also indicated lack of knowledge, lack of awareness, and poor practice on the standard precautions among fourth-year medical students during invasive procedures evidenced by 12.5% of trainees did not wash their hands, 57.5% did not wear masks and 65% did not wear aprons (Subramaniam et al., 2013). These future HPs are exposed to existing staff members in hospitals during their clinical attachments. Ensuring sufficient practices in HAIC among existing qualified HPs is crucial as the learners will be observing the wrong practices.

New initiatives are needed to improve the current HAIC measures collaboratively. The existing curriculum content on infection control on healthcare courses, at the universities in Klang Valley are developed by their own institutions but have to be accredited by Malaysia Qualifying Agency (MQA, 2021). The current HPs in the studied hospital were trained in HAI practices in silo during their training period. Therefore, improving IPL knowledge among existing HPs is influential to future development of IPL in Malaysia.

1.3 Research Questions

1. Is there any difference in self-assessment in CTW, attitude in IPL, perception in IPI, and attitude in the IPR on HAIC within and between experimental and control groups at pre-and-post intervention, after controlling for co-variables?
2. Is there any difference in knowledge, attitude and practices on HAIC within and between experimental and control group at pre-and-post-intervention, after controlling for co-variables?

1.4 Research Objectives

1.4.1 General Objective

This study aimed to develop, implement and evaluate the effectiveness of the interprofessional learning (IPL) approach module in hospital-acquired infection control (HAIC) among HPs.

1.4.2 Specific Objectives

1. To assess the self-assessment in communication and teamwork (CTW), attitude in interprofessional learning (IPL), perception in interprofessional interaction (IPI), and attitude in the interprofessional relationship (IPR) on hospital-acquired infection control (HAIC) among experimental and control groups.
2. To determine the differences in self-assessment in CTW, attitude in IPL, perception in IPI, and attitude in IPR on HAIC within and between experimental and control groups at pre-and-post intervention, after controlling for co-variables.
3. To assess the knowledge, attitude, and practices (KAP) on HAIC among experimental and control groups.
4. To determine the differences in KAP on HAIC within and between experimental and control groups at pre-and-post-intervention controlling co-variables.

1.5 Hypothesis

Hypothesis 1

There is a significant difference in self-assessment in Communication and teamwork, perception on Interprofessiona learning, attitude in interprofessional learning and perception in interprofessional relationship on hospital acquired infection control within and between experimental and control groups at pre-and-post intervention controlling co-variables.

Hypothesis 2

There is a significant difference in knowledge, attitude and practice on hospital acquired infection control within and between experimental and control groups at pre-and-post-intervention controlling co-variables.

1.6 Conceptual Framework

Concepts are abstractions of observable experiences and framework is the conceptual underpinnings of a study, including an overall rationale of the study (Polit & Beck, 2020). Conceptual framework (Figure 1.1) explains the direction of the study and facilitates in organizing the ideas on the study which includes the existing structures, processes involved and the outcomes expected upon implementation of the intervention. The reason this model was chosen is, the structure- process-outcome -model assess clinical practice and evaluates related activities.

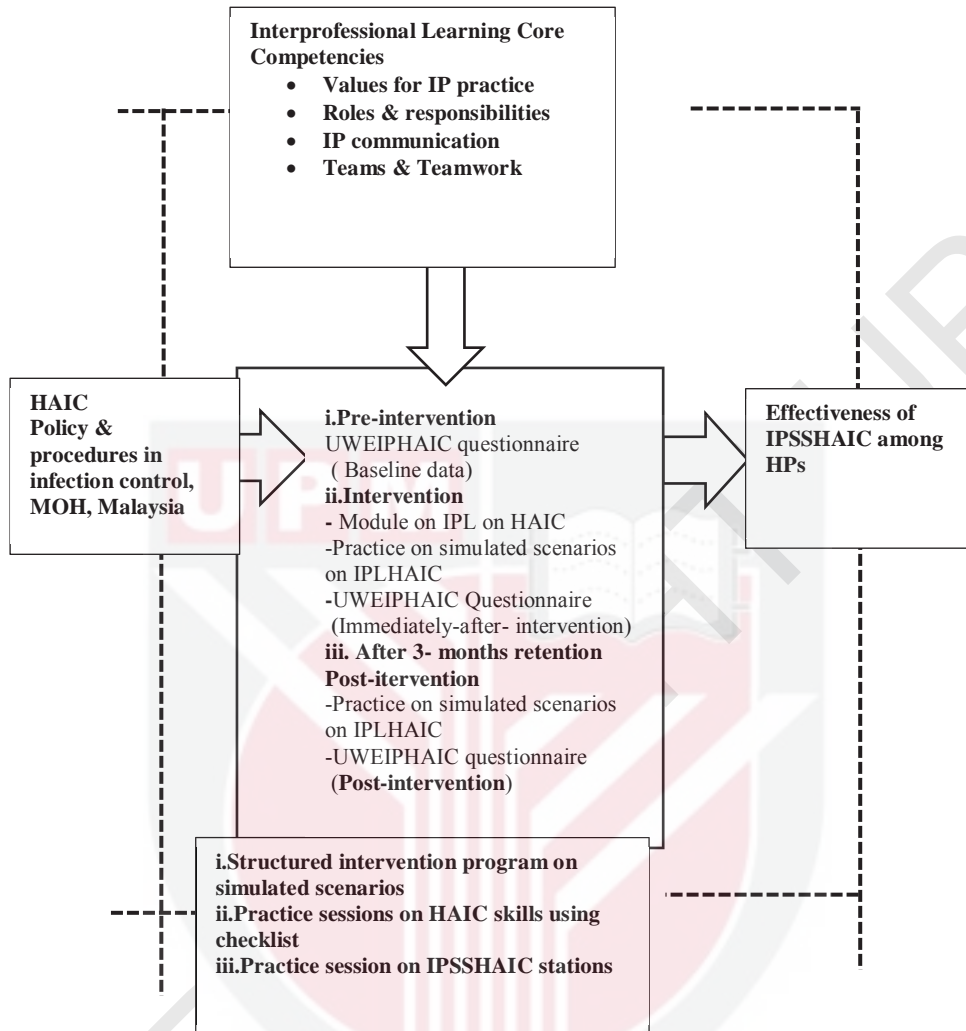


Figure 1.1 : Conceptual framework

Note: IPL=Interprofessional learning, Pre= Pre-intervention, Imm= Immediately after-intervention, Post=Post-intervention, HAIC=Hospital acquired infection control, IPSSHAIC=Interprofessionalsimulated scenarios on hospital acquired infection control

1.7 Operational definitions

Operational definitions illustrate detailed specifications on the concepts that need to be measured and collect needed information (Polit & Beck, 2020).

- i. **Education** is defined as the action or process of knowledge development (Merriam-Webster, 2020).
- ii. **Interprofessional learning** in this study refers to learning that occurs from, with and between HPs during the interactive sessions at the implementation of the IPL on HAIC intervention (Barr, 2002)
 - *Interprofessional education or learning in this study is used interchangeably as it refers to that occurs between HPs to enhance knowledge, attitude, and practices in HAIC during the intervention sessions.*
- iii. **Interprofessional collaborative practice** refers to “When multiple health workers from different professional backgrounds work together with patients, families, [careers], and communities to deliver the highest quality of care.” (WHO, 2010).
 - *‘Collaborative learning and working’ are synonymous with ‘interprofessional learning and working’ (CAIPE,1997).*
- iv. **Professions** are occupational groups who in general provide services to others, such as nurses or social workers. It can be used as a term of self-ascription to avoid the need to apply regulatory criteria which differ between groups (Barr, 2009).
- v. **Health professionals (HPs)** refers to medical doctors and staff nurses currently working in the studied hospital.
- vi. **Uniprofessional Identity:** Refers to the development of strong favoritism towards own profession (In-Profession Favoritism) while developing bias and prejudice against those in other related profession (Out-Profession Discrimination) to improve own self-concept (Khalili et al., 2014).
- vii. **Interprofessional care** refers to the healthcare provided by a team of HPs with overlapping expertise and a gratitude for the unique contribution of other team members as partners in achieving a common goal (Donovan, et al., 2018).
- viii. **Effectiveness of Interprofessional learning** refers to the efficiency to implement interprofessional practices in HAIC among HPs.
- ix. **Healthcare associated infections are infections** that patients acquire 48 or more hours after admission during the course of receiving treatment for other conditions within a healthcare setting (CDC) (Ministry of Health Malaysia, 2019).
- x. **Hospital-acquired infections (HAIs)** in this study refers to infections that patient acquires during the course of receiving treatment for other conditions

in the hospital. Needle -stick injuries and handling of sharps are also included as HAIs.

- x. **Hospital-acquired Infection control (HAIC)** refers to having the necessary knowledge, attitude and practices (KAP) in hospital-acquired infection control measures as stipulated in the policies and procedures of infection control as stipulated in the studied hospital policies.
- xi. **Interprofessional Hospital-acquired Infection control (HAIC)** refers to the implementation of HAIC measures by different professionals eg. doctors and nurses.
- xii. **Knowledge** is a body of facts learned by study (Merriam Webster Dictionary, 2020) and in this study refers to facts learned on HAIC.
- xiii. **Attitude** is a feeling or emotion towards a fact (Merriam Webster Dictionary, 2020) and refers towards feeling on carrying out procedures pertaining to HAIC.
- xiv. **Practice** is to perform or work at repeatedly so as to become proficient (skills) (Merriam Webster Dictionary, 2020) and refers to work (skills) performed pertaining to HAIC.
- xv. **Simulation** is an educational strategy in which a particular set of conditions are applied to resemble real situations that are possible in real life. Simulation can integrate one or more modalities to promote, improve, or validate a participant's performance (INACSL, 2016). **Simulation** in this study refers to IPL simulated scenarios in HAIC (IPSSHAIC).
- xvi. **Facilitator** is a trained HP who provides guidance, support, and structure at some or all stages of simulation-based learning including prebriefing, simulation, and/or debriefing (INACSL, 2011).
- xvii. **Simulated patient (SP)** refers to a person trained to consistently portray a patient or other individual in a scripted scenario for the purposes of instruction, practice, or evaluation (Lopreiato et al., 2016).
- xviii. **Standard Precautions** are a set of infection control practices that healthcare personnel use to reduce transmission of microorganisms in healthcare settings (CDC, 2015) and refers to HAIC practices in Malaysia.
- xix. **Core competencies** refer to the knowledge, skills and attitudes required for an infection prevention and control (IPC) professional to practice with an in-depth understanding of situations. The participants also need to use aspects eg., reasoning and critical thinking, and analyze the assessments. Thus facilitates them on decision-making on patient care in the prevention and control of HAIs and antimicrobial resistance (WHO, 2020).

1.8 Significance of the study

This study examined the effectiveness of an intervention using a module on the IPL approach utilizing simulated scenarios on HAIC among HPs. Pre-and post-tests will measure the effectiveness of self-assessment, attitude, and perception on aspects of IPL; and knowledge, attitude, and practices (KAP) in HAIC between the two arm participants.

Similarly, Luctkar-Flude et al., (2014) conducted a simulated IPL training on standard infection control practices; reviewing hand hygiene and wearing PPE when caring for patients eg., in a ventilated patient with acute respiratory distress syndrome. The findings showed learners' satisfaction level was high and suggested a more in-depth module to practice infection control skills within simulated complex patient care scenarios. Nevertheless, challenges in IPL eg., hierarchical questions and the disconnect among professions are significant barriers to patient safety. Health professionals need to change the way they work and relate to one another before they can work efficiently and collaboratively (Nelson et al., 2017). Interprofessional learning is needed in Malaysian healthcare education to create formal opportunities to work collaboratively thus, as a platform to understand the roles and responsibilities of other HPs (Jalina Karim et al., 2014).

In Malaysia, the current trend of the traditional curriculum of learning is in silo among HPs. The reason is as they qualify the staff is required to practice collaboratively. Evidence from this study will identify the gap between the current IPL practices and competencies in HAIC among the existing qualified HPs. The effectiveness of the IPL approach will provide valuable insight into future studies. Furthermore, Saraswathy et al., (2021), also concluded IP simulated scenarios are beneficial in providing well-organized training in improving HPs competencies in HAIC.

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