Knowledge, Attitudes, and Practices regarding Oral Care for Patients with Endotracheal Tube among Critical Care Nurses in Hospital Universiti Sains Malaysia

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DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated and duly acknowledged. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at Universiti Sains Malaysia or other institutions. I grant Universiti Sains Malaysia the right to use the dissertation for teaching, research and promotional purposes.

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VAP	Ventilator-Associated Pneumonia
ICU	critical care ward
CDC	Centre for Disease Control and Prevention
HBM	Health Belief Model

ABSTRAK

Amalan penjagaan mulut adalah penting dalam meningkatkan keselesaan pesakit dan apabila dilakukan secara berkesan boleh mencegah jangkitan mulut. Memberi penjagaan mulut kepada pesakit adalah salah satu asas dalam amalan kejururawatan dan jika diabaikan, boleh menimbulkan ancaman kepada pesakit terutamanya mereka yang mempunyai intubasi endotrachea dan pengudaraan. Matlamat kajian ini adalah untuk menilai tahap pengetahuan, sikap, dan amalan penjagaan kesihatan yang berkaitan dengan kesihatan oral untuk pesakit dengan tiub endotrachea di ICU, Hospital Universiti Sains Malaysia. Satu kajian keratan rentas telah digunakan dengan melibatkan 32 orang jururawat ICU di Hospital Universiti Sains Malaysia. Persampelan kemudahan (convenience sampling) telah digunakan sebagai kaedah pensampelan untuk kajian ini. Data dikumpul melalui soal selidik berstruktur yang terdiri daripada empat bahagian yang menilai pengetahuan, sikap dan amalan penjagaan kesihatan untuk pesakit intubasi serta memperolehi maklumat demografi jururawat. Purata pengetahuan, sikap dan amalan jururawat terhadap penjagaan mulut untuk pesakit intubasi adalah 54.2%, 92.8%, dan 57.8%. Kajian ini menunjukkan bahawa pengetahuan jururawat ICU mengenai penjagaan mulut adalah berkait dengan prestasi jururawat melakukan penjagaan mulut dari segi kekerapan ($p = 0.009$). Jururawat belajar lebih lanjut mengenai penjagaan mulut dari sekolah kejururawatan dan ini boleh menyumbang kepada peningkatan kekerapan jururawat yang melakukan penjagaan mulut untuk pesakit mereka ($p = 0.001$). Tunjuk ajar daripada jururawat senior yang berpengalaman juga menyumbang kepada amalan penjagaan mulut yang lebih baik dalam ICU ($p = 0.014$). Kajian ini menunjukkan bahawa jururawat yang memperoleh lebih banyak sumber pembelajaran tentang penjagaan mulut mempunyai pengetahuan yang lebih tinggi tentang amalan penjagaan mulut dan ia boleh mempengaruhi amalan mereka untuk memberi penjagaan mulut kepada pesakit intubasi.

ABSTRACT

Oral care practice is essential in improving patients' comfort and when performed effectively can prevents oral infection. Providing oral care to patient is one of the fundamental in nursing practice and if ignored, could poses a threat to patients especially those with endotracheal intubation and ventilation. The aim of this study was to assess nurse's level of knowledge, attitude, and practice regarding oral care for patient with endotracheal tube in ICU, Hospital Universiti Sains Malaysia. A cross sectional study was used involving 32 ICU nurses in Hospital Universiti Sains Malaysia. Convenience sampling was used as a sampling method for this study. Data were collected by structured questionnaire which consist of four sections evaluating nurses' knowledge, attitudes, and practices of oral care for intubated patients and acquiring nurses' demographic information. The average percentage ICU nurses' knowledge, attitudes, and practices of oral care for intubated patients were 54.2%, 92.8%, and 57.8%, respectively. This study showed that ICU nurses' knowledge about oral care was associated with nurses' oral care performance in term of frequency ($p = 0.009$). Nurses learn more about oral care from nursing school which may contribute to the increase in frequency of nurses providing oral care for their patients ($p = 0.001$). Guidance from experienced senior ICU nurses also contribute to better oral care practice in ICU ($p = 0.014$). the findings of this study show that nurses who acquire more relevant source of learning about oral care have a higher knowledge about oral care practice and it may affect their practice of providing oral care for intubated patients.

CHAPTER 1: INTRODUCTION

1.1 Background of the Study

Oral care is a procedure of maintaining the overall hygiene of oral cavity and providing comfort for the patients. It is one of the fundamental nursing cares for patients, particularly those who require assistance with activities of daily living. Oral health and general health of a patient are constantly connected with each other. As stated by Sreenivasan, Ganganna, and Rajashekaraiah (2018), both are interdependent of one another through biological, psychological, emotional and development factors. Thus, making oral care as essential practice as other general care for patients.

In critical care settings, most patients are completely depending on nurses and caregivers to tend for them as they recover. But they still have a risk of contracting diseases, for instance nosocomial infection which is one of major problems for patients aided with ventilator to achieve full recovery. Timsit, Esaied, Neuville, Bouadma, and Mourvllier (2017) in their research stated that the most efficient way to prevent the onset of the disease is to reduce the risks of exposure. They also noted the benefits of oral care as a preventive measure against ventilator-associated pneumonia. In previous study highlighting strategies in preventing ventilator-associated pneumonia, it stated that oral care can reduce the rate of pneumonia and act as one of the practices to prevent the exposure to the disease. (M. Klompas et al., 2014; Shi et al., 2013).

Ventilator-Associated Pneumonia (VAP) is one of the most common nosocomial infection that infects patients admitted to ICU (Vincent, 2004). In a critical care setting, VAP poses a threat to ventilated patients mainly due to the presence of a direct route to the lower part of the respiratory tract in which the bacteria can manifest (Augustyn, 2007). In addition to that, patients with compromised defend mechanisms can be at a greater risk

of contracting the infection. As proposed by one study, two type of risk for VAP have been identified, namely intervention related such as tracheostomy, drainage and reintubation, and host related factors which includes medical history, extreme age and immunocompromised (Timsit et al., 2017). Most of which were related to patients admitted to critical care ward or ICU. Furthermore, accumulation of pathogens can enter the lower part of respiratory tract through leakage around the endotracheal tube cuff or lumen of the tube (Chastre & Fagon, 2002). The cuff combines with the formation of biofilm from the bacteria prevent the natural defend mechanism to expel the bacteria and secretions. Thus increasing the need of oral care and manual tracheobronchial suctioning (Craven & Hjalmarson, 2010).

Statistically, previous study have shown that 10% to 20% of patients admitted with ventilation intervention for more than 48 hours develop VAP and thus have longer time spent in hospitalization and increase in cost per admission of patients with VAP. (Safdar, Dezfulian, Collard, & Saint, 2005). Another recent study stated that the incidence of VAP ranges from 5% to 67 % based on the used diagnostic characteristic and case (Barbier, Andremont, Wolff, & Bouadma, 2013). However, the true incidence rate of this infection to occur was inconclusive due to the unspecific nature of the term surveillance. This was further supported since there were other researches that stated much lower rate of VAP, but the lower rates of that studies were not clearly reflect the association between care given and the surveillance criteria for this disease, which was subjective in the first place (Dudeck et al., 2011; Michael Klompas, 2012).

As precaution measure, many interventions have been taken as consideration for the prevention of the diseases and one of many was oral cavity decontamination through oral care procedure. Oral care reduces the amount bacteria growth in the cavity by mechanical and pharmacological interventions. Both of these interventions might

potentially decrease the probability of the bacteria to manifest in oropharynx area and further (Augustyn, 2007). As patient's first line of defense, nurses should be knowledgeable toward such practice and prioritize to implement it in care based on published guidelines or set protocol for the benefits of patients especially in ICU and critical care setting. However, that may not be the case. As stated by DeKeyser Ganz et al. (2009), many nurses considered oral care as high priority in care, but many do not implement the intervention following the latest guidelines and protocol recommendation in their care for patients.

In general, oral care procedure is thought in nursing school as a fundamental care for patient's airway management, but very little about it was stressed to students throughout their nursing course (Sole et al., 2003). Therefore, they knew the benefits it may have but not considered it as important enough.

1.2 Problem Statement

Oral care is one of the fundamentals of care in nursing practice (Augustyn, 2007). For several factors, nurses seem to not priorities oral care for patients with endotracheal tube. Even though this procedure is a basic knowledge to all nurses; some just take it lightly if the situation is unpreferable (Sole et al., 2003). This kind of practice can lead to further complication, one of which is ventilation-acquired pneumonia and can possibly cause death. A study has shown that 10% to 20% of patients admitted with ventilation intervention for more than 48 hours develop VAP (Safdar et al., 2005). In addition, patients with VAP possibly have a longer stay in the hospital, which in turn, increase the overall cost for treatment. This was supported by Safdar et al. (2005) in their study whereby they stated that patients who develop VAP will need to pay up to USD $10,019 in additional hospital costs. Another recent study stated that the incidence of VAP ranges from 5% to 67 % based on the used diagnostic characteristic and case (Barbier et al., 2013). Instead of recovery from initial cause of hospitalization, patients might suffer from additional illness and economic problems due to lack of attention from the nurses regarding the knowledge of oral care. In Malaysia, a report by Malaysian Registry of Intensive Care in 2017 showed that the rate of ventilator-associated pneumonia was 1.6 per 1000 ventilator day, which was a decrease by more than half in the last four years. Meanwhile, in 2016, a retrospective study done to 300 adult patient admitted to ICU in Hospital Universiti Sains Malaysia to describe the incidence of VAP, mortality, association factors of VAP, and characteristics of VAP patients, discovered that 34.68% of the patient admitted developed VAP after 48 hours of mechanical ventilation with 47.11 % mortality rate (Khan et al., 2016). In addition, the average age of VAP patient was 52 years old with most of them have other illnesses which may directly or indirectly contribute to contracting VAP. This shows that VAP still poses as a threat to vulnerable

patient if not handle well, even if the case reported was decreasing. Therefore, the level of knowledge, attitudes, and practices of oral care among the nurses in critical care setting need to be assessed for better care and prevention of further complications.

1.3 Research Questions

1) What is the level of knowledge, attitudes, and practices regarding oral care for patients among critical care nurses in Hospital Universiti Sains Malaysia?
2) Is there any association between the demographic data (age, level of study, type of critical care setting, working experience and sources of learning) and the knowledge, attitudes and practices of oral care among critical care nurses in Hospital Universiti Sains Malaysia?
3) Is there any correlation between knowledge, attitudes, and practices of oral care among critical care nurses in Hospital Universiti Sains Malaysia?

1.4 Research Objective

1.4.1 General Objectives

To determine nurse's level of knowledge, attitudes, and practices regarding oral care for patient with endotracheal tube in ICU, Hospital Universiti Sains Malaysia.

1.4.2 Specific Objectives

1) To determine level of knowledge, attitudes, and practices regarding oral care among critical care nurses in Hospital Universiti Sains Malaysia.
2) To determine the association between the demographic data (age, level of study, type of critical care setting, working experience and sources of learning) and the knowledge, attitudes and practices of oral care critical care nurses in Hospital Universiti Sains Malaysia.
3) To determine the correlation between knowledge, attitudes, and practices of oral care among critical care nurses in Hospital Universiti Sains Malaysia.

1.5 Hypothesis

1) H_o : There is no significant association between demographic data (age, level of study, type of critical care setting, working experience and sources of learning) and the knowledge attitudes and practices of oral care among critical care nurses in Hospital Universiti Sains Malaysia.

   H_A : There is significant association between demographic data (age, level of study, type of critical care setting, working experience and sources of learning) and the knowledge attitudes and practices of oral care among critical care nurses in Hospital Universiti Sains Malaysia.

2) H_o: There is no significant correlation between knowledge, attitudes, and practices of oral care among critical care nurses in Hospital Universiti Sains Malaysia.

   H_A: There is significant correlation between knowledge, attitudes, and practices of oral care among critical care nurses in Hospital Universiti Sains Malaysia

1.6 Conceptual and Operational Definitions

Table 1. 1 Definition of Terms

Terms	Conceptual definitions	Operational definitions
Knowledge	understanding of or information about a subject that you get by experience or study, either known by one person or by people generally. (Cambridge Dictionary, 2019)	The level of understanding among critical care nurses regarding effective oral care proposed by published guidelines and protocol.
Attitude	Attitude is the way you feel about something or someone, or a particular feeling or opinion (Cambridge Dictionary, 2019)	Nurses opinion towards prioritizing oral care in daily patient care routine.
Practice	Repeated exercise in or performance of an activity or skill to acquire or maintain proficiency in it. (Oxford dictionary, 2019).	Rate at which effective oral care is exercised by the nurses in critical care setting.
Oral Care	Personal and bedside care of the oral cavity including the gingivae, teeth, lips, epithelial covering of the mucosa, pharynx, and tongue. (Medical Dictionary, 2009)	A care to maintain patient's oral hygiene which will provide comfort to the ICU patient with endothracheal tube and prevent bacterial growth and serious complication caused by the infection.
Endotracheal tube	a small usually plastic tube inserted into the trachea through the mouth or nose to maintain an unobstructed passageway especially to deliver oxygen or anesthesia to the lungs. (Merriam-Webster, 2019)	A small tube inserted through trachea of the patient to assist and provide clear and secure airway for oxygen delivery directly to the lungs.
Critical Care	The specialized care of patients whose conditions are life-threatening and who require comprehensive care and constant monitoring, usually in intensive care units. Also known as intensive care. (MedicineNet, 2018)	A type care which is essential for patients with life threatening condition. A nurse must be efficient and highly skilled in providing comprehensive care for the patients .

1.7 Significance of the Study

This study is aimed to investigate the level of knowledge attitudes and practices of critical care nurses toward oral care for intubated patient. At a greater scope, this study might be beneficial in providing enlightenment on how critical care nurses' perception on oral care practice in their service. This study will act as reference in highlighting one of factors contributing towards ventilation-associated pneumonia and stresses the importance of oral care in prevention measures. For nursing students, this study can act as one of the reminders of how important knowledge towards oral care and the harm that might happen to patients if not taken seriously. This will teach them to prioritize oral care which then increases the performance and competency before pursuing their career as a registered nurse. The correlation between knowledge, attitudes, and practice in oral care might be useful for further studies as one of the baselines relating to topic of oral hygiene.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The purpose of this study is to assess level of knowledge, attitude, and practice in of oral care for patients with endotracheal tube among critical care nurses at Hospital Universiti Sains Malaysia. In this literature review, it consists of definition of oral care, knowledge of oral care, attitudes towards oral care, oral care practices, correlation of oral care knowledge, attitudes and practices and its association with sociodemographic, and conceptual framework.

2.2 Review of literature

2.2.1 Knowledge of oral care among nurses.

Chan and Hui-Ling Ng (2012) in their study of assessing nurses' oral care knowledge, attitudes and practices for critical ill patients stated that nurses lacked adequate knowledge related to oral health. They further emphasized the need to continue the learning process and training in this matter. Nurses also lack the knowledge in ventilated-associated pneumonia prevention (Blot et al., 2007). Further stating that nurses acknowledged that oral was the best way for intubation but unable to grasp the importance of care for oral health and ventilation machine. A study by (Labeau et al., 2008) to assess knowledge in preventing VAP in 22 European countries found that nurses working in intensive care unit had low scores in VAP prevention test and their average score in that study was 45.1%. These literatures indicate that nurses may have an understanding of oral health care and risk of ventilated-associated pneumonia but lack knowledge regarding maintaining oral health and preventing VAP on intubated patients.

2.2.2 Attitudes towards oral care.

In a study conducted by DeKeyser Ganz et al. (2009), nurses were given a survey to rate their perceived level of priority concerning oral care practice based on a scale of 1-100. Where 1 represented the lowest priority and 100 being the highest priority. From that, it was found that the mean score rated by the nurses was 67.0. Another study also using similar 100-point scale survey to rate nurses' oral care priority. They found that the mean rating was 53.9 (Grap, Munro, Ashtiani, & Bryant, 2003). Soh, Soh, Japar, Raman, and Davidson (2011) studied the attitudes of nurses regarding oral care practice for mechanically ventilated patients in Malaysia using Likert Scale noted that more than 89% of the nurses agreed that oral care was very important for mechanically ventilated patients. However, further in their study, they found that more than 40% felt that oral care was a difficult and unpleasant task, referring to cleaning the oral cavity of the patients. A study by Binkley, Furr, Carrico, and McCurren (2004) performed on 102 intensive care unit in US found that 62.3% of 556 nurses believed that oral was a high priority. Lin, Chang, Chang, and Lou (2011) in their study, asked ICU nurses in Taiwan to ranked oral care priority among other physical care activities and nursing treatment activities. The result collected shown that the nurses ranked oral care third and eighth, respectively. They also found that the average percentage of ICU nurses' attitudes toward oral care was 79.4%. From these literatures, it indicates that nurses have considered oral care practice to be an intermediate to high priority care.

2.2.3 Practices of oral care.

Oral care is one of the fundamental cares in nursing (Sole et al., 2003) and nurses ought to learn and practice it in their job. In a study by Binkley et al. (2004) noted that although nurses ranked oral care a high priority, they did not implement recent evidence

and guidelines into their current work practice. They found that 92% of 556 ICU nurses perceived oral care to be a high priority care for patients in ICU, but almost 80% of the respondent rarely use toothbrush as a tool for oral care procedure. While a study by Fitch, Munro, Glass, and Pellegrini (1999) shown that oral care with toothbrush improve oral health. Other study also shown to has similar result where nurses in ICU were not complying to latest evidence when practicing oral care for patients (DeKeyser Ganz et al., 2009). The finding shown that 84% of 218 practicing ICU nurses used gauze pads, followed by tongue depressor (55%) and the least used toothbrush (35%) when performing oral care.

Aside from appropriate tools for oral care procedure, frequency of care given to the patients is also important. In some hospitals, nurses performing oral care after every change in shift, such as shown in a study by Sreenivasan et al. (2018) where 95% of the nurses performed oral care after every shift change which was programmed every 6 hours in 86% of hospitals they surveyed. Hanneman and Gusick (2005) also discovered that nurses reported more frequent oral care practice for patients than was documented. From the study, nurses reported that the frequency of oral care given to the intubated patients was 4.2 times per 24 hours, which was more than the documented frequency of 3.3 times per 24 hours. In that same study, the researcher discovered that the main supplies and equipment in performing oral care for intubated patient were normal saline, cotton swab, chlorhexidine, and hydrogen peroxide.

Another study by Cason, Tyner, Saunders, and Broome (2007) regarding nurses implementation of guidelines for VAP, they found that half of the nurses studied performed oral suctioning every two hours, while 46% of the nurses wiped their patients' teeth every two hours. Forty nine percent of the nurses stated they brushed their patients' teeth every 8-12 hours. Therefore, from the cited literature, nurses consider oral care

higher in the list of priority but often failed to recognize the importance of properly implement oral care in nursing practices.

2.2.4 Associated factor of knowledge, attitudes, and practices of oral care among nurses

The quality of oral health care given to the patients might be influenced by nurses' knowledge, attitudes, and practices of oral care. A study by Ross and Crumpler (2007) to determine whether the quality of oral care will be affected by an evidence-based practice (EBP) educational program. Based on the result, they concluded that by using educational program, nurses' quality of providing of oral care to the patients will improve. This shows that knowledge could affect nurses' practices in providing oral care. Another study by Lin et al. (2011) also support the statement in their study of critical care nurses' knowledge, attitudes and practices of oral care. Their findings revealed that there was a significant positives correlation between knowledge and practice of oral care among nurses. However, several studies in the past have shown that this might not be the only case. In a multisite study of facilities that use closed-system suctioning device conducted by Sole et al. (2003) on a total of 1665 nurses in United States found that the main influence in the quality of nurses performing oral care task was their clinical educators and coworkers. Second was knowledge of the nurses regarding oral care. Another example of research is one conducted by Allen Furr, Binkley, McCurren, and Carrico (2004) to identify the factors affecting quality of oral care given to patients in ICU. By using quality and frequency of oral care performed as dependent variables, they found that nurses provide poor quality of oral care if the felt that it was unpleasant work. In contrast to that, it the nurses felt that they have more time to perform oral care, the quality

of oral care will increase. Nurses who perceived oral care to be a top priority and not an unpleasant task provided a top-quality oral care for the patients.

Nurses practice of oral care can also be influence by the standardization of oral care procedure in the hospitals they are working with. A study by Cason et al. (2007) agreed that standardization of procedure based on guidelines from Centre for Disease Control and Prevention (CDC) can change how nurses perceive oral care. Based on the result of their study of nursing implementation of guidelines from CDC in preventing ventilator-associated pneumonia, the frequency of nurses washing their hands increased if their ICU standardized oral care procedure, joined programs for improving infection control, if their ICU were surgical or trauma and if they were women. Another finding from the same research stated that the head of patients were raised to 30-45 degree for longer period if the nurses, had standardized oral care procedure, and had more experience working with critically ill patients.

All the cited studies show that nurse's practice on oral care were not only influenced by their knowledge, attitudes and practices when providing oral care for their patients. Other factors play a role in affecting nurses' practice of oral care. This includes experience working in ICU and critical care units, gender, type of ICU and whether it has as standardized oral care procedure, whether the nurses have enough time in performing oral care and whether the nurses have joined any program to improve infection control. All factors mentioned previously affect knowledge, attitudes, and practices of critical care nurses in providing oral care. Therefore, this study aims to investigate critical care nurses' knowledge, attitudes, and practices of oral care for patients with endotracheal tube.

2.3 Conceptual/Theoretical framework

Health Belief Model (HBM) is used as a base for theoretical framework of this study. HBM is a psychological health behavior change developed in early 1950 by a group of social psychologists (Godfrey Hochbaum, Irwin Rosenstock and Stephen Kegels) in the U.S. Public Health Service. It was developed in an attempt to understand the low participation in screening test for early detection of asymptomatic diseases. This model derived from psychological and behavioral theory that hypothesized that behavior mainly depends on two variables. First is the value placed by the person on a particular goal and second, estimation made by the person on the probability that the goal can be achieved. Hence, when these variable were adapted for health concerned behavior, the corresponding variables were first, the need to avoid the diseases or illness and second, a belief that specific health action can prevent or cure the illness (Janz & Becker, 1984). The earlier constructs of HBM were that for the person to take action to avoid the illness, first, he would have to belief that he was susceptible to the illness and second, the illness would have a degree of severity on some part of his life if it was to occur. The third, by taking a particular action upon the illness would be beneficial to reduce his susceptibility to the illness or reduce the severity of the illness if it was to occur, and that the psychological barriers such as cost and pain will be outweighed by the benefits of recommended action (Rosenstock, 1974).

As described by Janz and Becker (1984), HBM consisted of specific dimension. First was perceived susceptibility, where individual has a feeling of vulnerability to a condition (in this case, medically established illness). Second, perceived severity, where the individual feels the seriousness of contracting the illness or leaving the illness untreated. Third, perceived benefit, where individual belief regarding the effectiveness of the actions to reduce the disease threat. Fourth, perceived barrier, where the potential

negative aspect of the recommended action may act as impediment to undertaking the action. Janz and Becker (1984) also noted that cue to action might be internal (for example, symptoms) or external (for example, mass media or post cards). Lastly, they also mentioned that demographic, sociopsychological, and structural variables might affect individual's perception in taking action. Thus, indirectly influence health-related behavior. Figure 2.1 below illustrates Health Belief Model.

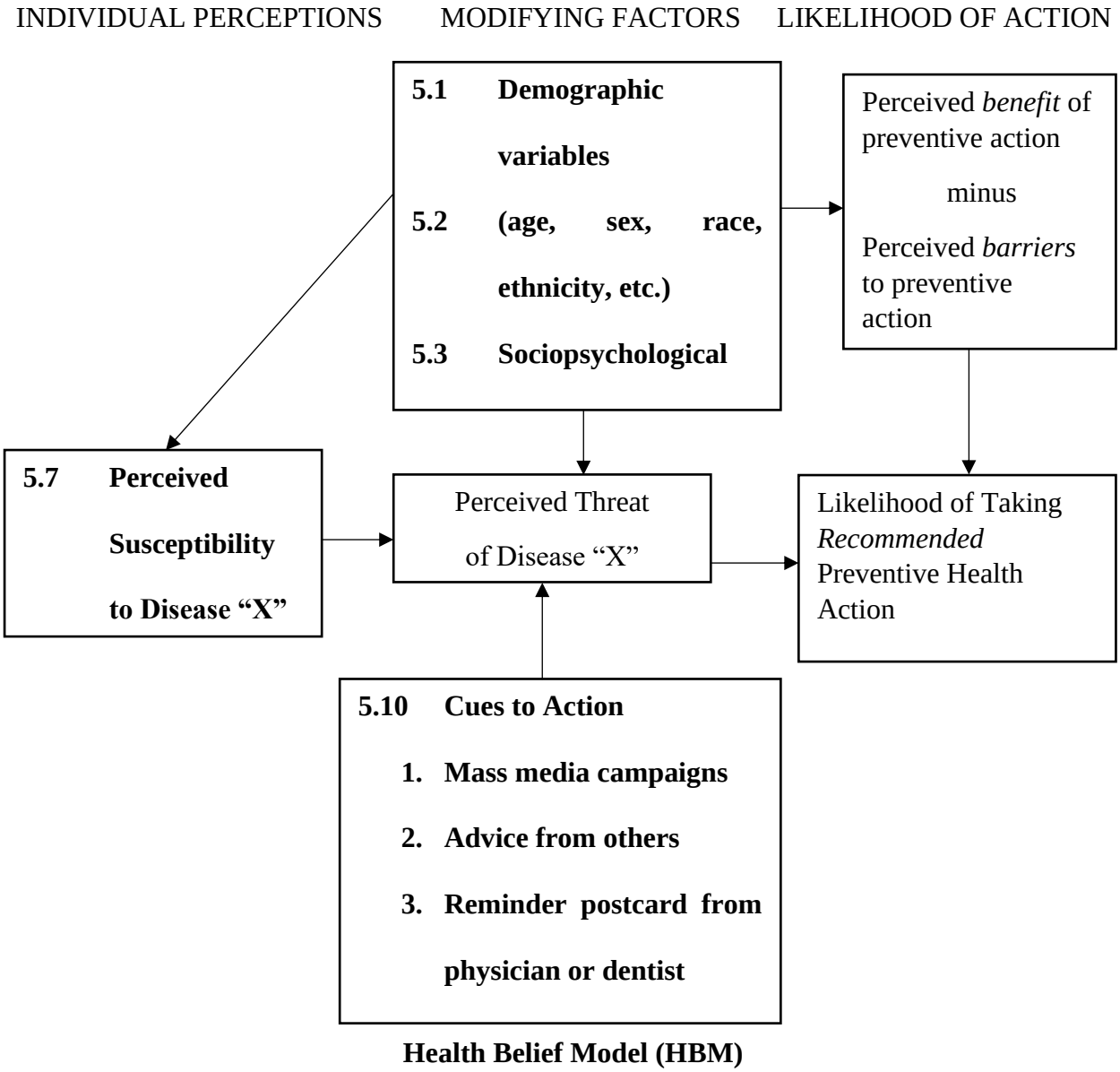
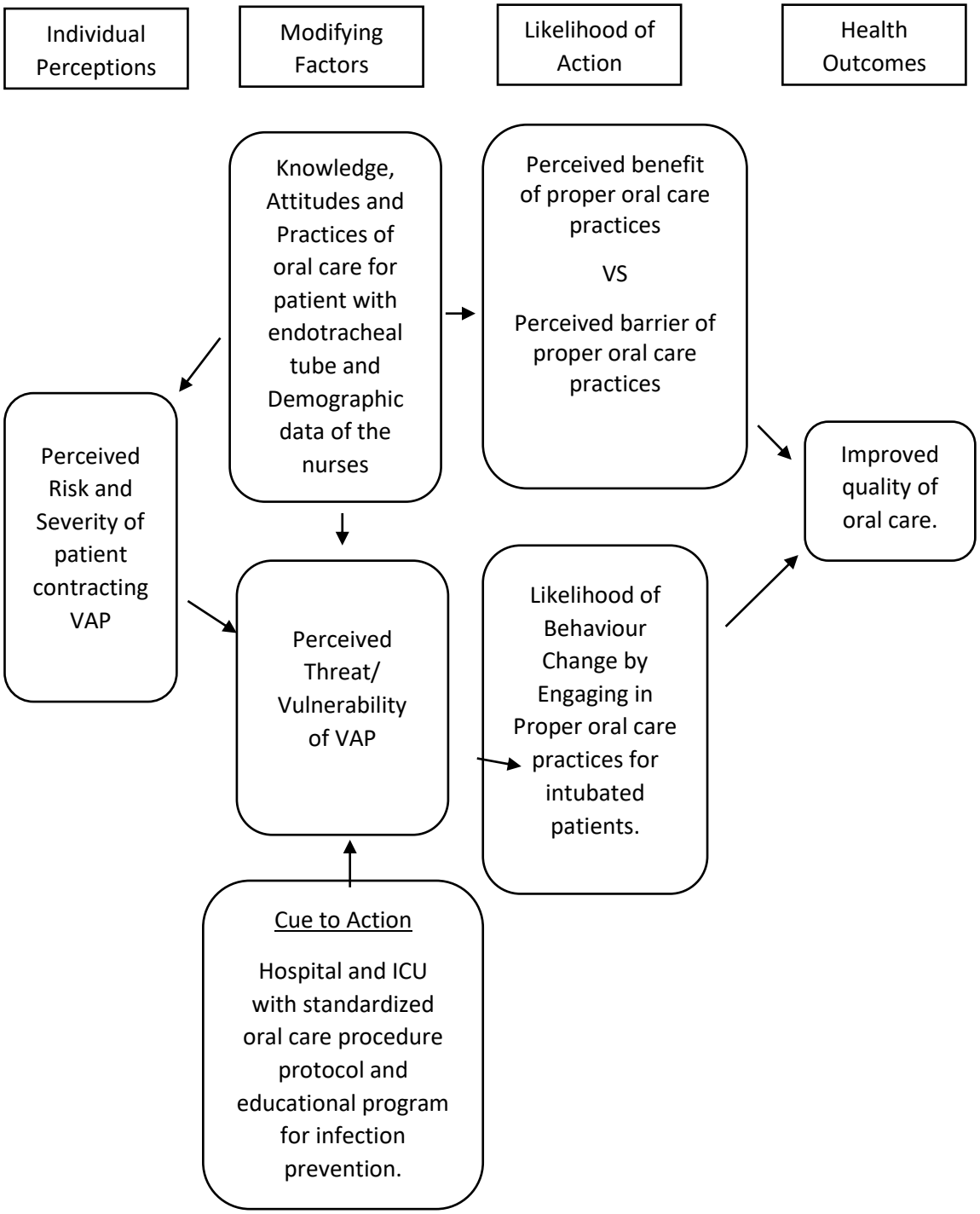


Figure 2. 1 Theoretical framework



Health Belief Mode (Adopted from Rosenstock, 1974)

Figure 2. 2 Conceptual framework

Figure 2.2 illustrates a Health Belief Model modified to be applied in this study. This conceptual framework differs from the original model because the situation is different, behavior of critical care nurses in providing oral care for patients with endotracheal tube. In this study, concept of perceived susceptibility is when the critical care nurses believe that the patients might contract ventilator-associated pneumonia if no preventive actions are taken.

Next, perceived severity is when the nurses believe that the disease would seriously affects the patients' life and recovery if it occurs or leaving the disease untreated. Cue of actions is the external event which will motivates nurses in performing oral health care for the patients. In this model, the cues of action are standardized oral care procedure and protocol in hospital and ICU they are working with, educational programs for improve in infection prevention, reading materials and remainder or warning from physician or employers. Perceived benefit is when the nurses believe that prevention of ventilator-associated pneumonia (VAP) can be achieved if proper oral care is provided to the patients. Other benefits are faster patients' recovery process, patients and relative would not be burden by extra fee, no prolong stay in the ward and reduced mortality rate and infection rate of VAP.

While perceived barrier is when felt certain hardship in continuing to perform oral care for patients. The barriers which would demotivate the nurses include time constraint to provide oral care, limited supplies and equipment which renders nurses unable to provide proper oral care, and lacking knowledge and experience working with critical care patient.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter mainly focuses on the research design, population and setting, sampling plan that consists of inclusion and exclusion criteria, method of sampling, instrumentation used in this study, its variables, and the explanation on how the data of this study will be collected, presented and analyzed. This research attempts to study the level of knowledge, attitude, and practice of oral care for intubated patients among critical care nurses in Hospital Universiti Sains Malaysia.

3.2 Research design

This research used a cross-sectional study design and is a quantitative study. The objectives of this study were to assess the level of knowledge, attitude, and practice regarding oral care for intubated patients among critical care nurses in Hospital Universiti Sains Malaysia.

3.3 Population and setting

This study was conducted on registered nurses working in critical care area at Hospital Universiti Sains Malaysia. Thus, includes 1 Mutiara (ICU) with 45 nurses, 1 Fairuz (CCU) consist of 20 nurses, 8 Selatan ward consist of 30 nurses, 2 Delima ward consist of 39 nurses and SICU with 26 nurses. The data from the total of 158 respondents will be collected in September 2019 until December 2019.

3.4 Sampling plan

3.4.1 Inclusion and exclusion criteria

Inclusion criteria

1. All respondents are currently working as a registered staff nurse at critical care area in Hospital Universiti Sains Malaysia.
2. Having experience in providing oral care for intubated patients based on their nursing care plan documentation for their patient
3. Able to understand, speak and write in English.

Exclusion criteria

1. Have no experience in providing oral care.
2. Student nurse or trainee in the area.
3. Not willing to participate in this study.

3.4.2 Sampling method

Convenience sampling was used as a sampling method in this research. Convenience sampling method is one of the non-probability sampling techniques where the researcher selects subjects that are conveniently accessible to researcher. In this research, convenience sampling method will be used because it is cheap and only requires short period of time to recruit participants based on inclusion and exclusion criteria.

3.4.3 Sample size estimation

The total population of critical care nurses n Hospital Universiti Sains Malaysia was 158. This study used sample size formula proposed by Cochran (1977) :

$$n0 = \frac{Z^2 p(1-p)}{e^2}$$

Whereby,

*n*0 = Required sample size

Z = Value representing the desired confidence level (CI:95%, Z = 1.96)

e = Level of precision, ±5% (0.05)

p = Anticipated population proportion, p = 50% (0.5)

Calculation:

$$n0 = \frac{Z^2 p(1-p)}{e^2}$$

$$n0 = \frac{(1.96)^2(0.5)(1-0.5)}{0.05^2}$$

$$n0 = 384.16$$

$$n0 = 384$$

The sample size calculated from this formula was bigger than the targeted population. Therefore, a modification was made using this equation:

$$n = \frac{n0}{1 + \frac{(n0-1)}{N}}$$

Whereby,

*n*0= Unadjusted sample size, 384

N = Targeted population size, N = 158

Calculation:

$$n = \frac{384}{1 + \frac{(384-1)}{158}}$$

$$n = 112.15$$

$$n = 112$$

The sample size calculated from this equation was 112 nurses and after considering 5% drop out, the calculate sample size was:

$$n = \frac{n\ calculated}{1 - dropout\ rate}$$

$$n = \frac{112}{1 - 0.05}$$

$$n = 117.89$$

$$n = 118$$

Hence, the sample size for this study was 118 critical care nurses in Hospital Universiti Sains Malaysia.

3.5 Instrumentation

A self-administered questionnaire was used in this study to gather information for this study.

3.5.1 Instrument

The instrument for this study was a structured, self-administered questionnaire focusing on the level of knowledge, attitude, and practice of oral care for patients with endotracheal tube among critical care nurses. The tool and permission to use were obtained from the original author (Lin et al., 2011). In this research, some modifications were made to the questionnaire to ensure that it follows the standard protocol used by critical care nurses in Hospital University Sains Malaysia. The instrument was divided into 4 section, demographic data, knowledge of oral care for intubated patients, attitude about oral care for intubated patients, and practices of oral care for intubated patients.

Section A: Demographic data

These include age, highest level of nursing education, type of ICU, total years of working experience, years of current ICU experience and sources of learning about oral care for intubated patients. The sources of knowledge of oral care was added together to form total number of 6 sources of learning, with a range of 0-6.

Section B: knowledge of oral care for intubated patients

In this section, participants had to answer six multiple choice questions with the total of 29 items. These questions test the knowledge of the nurses regarding the characteristics of oral cleaning solutions and tools that effectively remove plague in oral care procedure.

Section C: attitude about oral care for intubated patients

This section of the questionnaire consists of two part. The first part contains two question asking nurses opinion on the priority of oral care in physical care activities for ICU patients and priority of oral care in nursing treatment activities for ICU patients. Physical care activities differ from nursing treatment. Physical care activities are activities that nurses able to perform without any form of order to promote comfort for the patients. For instance, bed bath, physical assessment and positioning the patients. In the other hand, nursing treatment activities are those activities in which the nurses' actions will have a greater impact in patients' recovery and survival and might need physician' order to proceed. For example, administering medications, oxygen therapy, and assisting doctor in invasive procedure.

The second part of this section consists of two questions asking the nurses to rank, based on their opinion, the importance of oral care in physical care activities and in nursing treatment activities. The answers are in the form of 10 points scale where the higher the scores equal to higher priority regarding oral care for patient.

Section D: practices of oral care for intubated patients

There are four questions in this section. Nurses was asked regarding the frequency of performing oral care activity, aid in maintaining patient's oral moistness and helping patient remove oral secretion. Nurses need to choose the best possible answer for each question which have different frequency and duration option. Together with the minimum standard suggested by the literatures, these four questions determined the frequency or duration of performing this practice. The sum of the score will be the total score of the frequency of performing oral care practices ranging from 0-4.

3.5.2 Validity and reliability

The questionnaire was validated by three panel of experts with nursing background content validation while the test-retest or pilot study will be conducted afterword. The validity of this questionnaire was determined by analyzing the factors and principle components. Moreover, the pilot study was conducted by using selected group 5 respondent in each critical care unit that met the criteria. The purpose of pilot study in research was to determine the reliability and the feasibility of an approach before using it in a larger scale (Leon, Davis, & Kraemer, 2011). It also be used to detect the uncertainty of the questions and acquire response and suggestion for further improvement of the questionnaire.