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KNOWLEDGE, RISK PERCEPTION AND ATTITUDE TOWARDS NEEDLESTICK INJURY PREVENTION PRACTICE AMONGST HEALTHCARE WORKERS IN A TERTIARY HOSPITAL

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MASTER OF SCIENCE IN OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT
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Abstrak

Kecederaan tusukan jarum suntikan (NSI) merupakan salah satu risiko pekerjaan yang signifikan bagi petugas kesihatan kerana ia boleh menyebabkan mereka terdedah kepada jangkitan bawaan darah yang serius seperti HIV, Hepatitis B dan Hepatitis C. Walaupun garis panduan pencegahan telah diwujudkan, kecederaan akibat tusukan jarum suntikan masih berlaku. Hal ini mungkin disebabkan oleh wujudnya kelemahan dalam beberapa faktor yang mempengaruhi amalan pencegahan dalam pengendalian prosedur yang melibatkan jarum suntikan. Kajian ini dijalankan bagi mengenalpasti pengaruh pengetahuan, persepsi risiko dan sikap terhadap amalan pencegahan kecederaan akibat tusukan jarum suntikan dikalangan petugas kesihatan di sebuah fasiliti kesihatan di Malaysia. Kajian ini dijalankan secara *cross-sectional* menggunakan borang soal selidik yang mengandungi empat konstruk utama iaitu : pengetahuan, persepsi risiko, sikap dan amalan pencegahan tusukan jarum suntikan. Data telah dikumpul daripada 250 orang responden melalui kaedah persampelan rawak mudah. Analisis statistik deskriptif, korelasi Pearson dan regresi berganda dilakukan menggunakan perisian SPSS untuk menentukan hubungan serta pengaruh setiap pemboleh ubah. Hasil kajian menunjukkan bahawa pengetahuan, persepsi risiko dan sikap kesemunya mempunyai hubungan korelasi positif terhadap amalan pencegahan tusukan jarum suntikan. Analisis regresi berganda juga telah menunjukkan bahawa sikap merupakan faktor yang paling mempengaruhi amalan pencegahan tusukan jarum suntikan, diikuti dengan pengetahuan dan persepsi risiko. Kesimpulannya, hasil kajian ini telah mengetengahkan faktor-faktor yang mempengaruhi amalan pencegahan tusukan jarum suntikan serta menekankan kepentingan memupuk sikap positif, memperbaiki persepsi risiko dan mengukuhkan pengetahuan dikalangan petugas kesihatan. Hasil dapatan daripada kajian ini boleh digunakan sebagai panduan untuk menyediakan program intervensi dan program pendidikan yang lebih bersasar bagi mengurangkan kejadian kecederaan akibat tusukan jarum suntikan.

Kata kunci: *amalan pencegahan, tusukan jarum suntikan, pengetahuan, persepsi risiko, sikap, amalan pencegahan tusukan jarum suntikan.*

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Abstract

Needlestick injuries (NSI) pose a significant occupational hazard to healthcare workers as it exposes them to serious bloodborne infections such as HIV, Hepatitis B and Hepatitis C. Despite existing preventive guidelines, NSI occurrences still persist. This may be due to gaps in several factors influencing the adaptation of safe practice in handling needle-related procedures. This study aimed to examine the significant influence of knowledge, risk perception and attitude towards NSI prevention practices amongst healthcare workers in a Malaysian healthcare setting. A cross-sectional study was conducted using a structured, self-administered questionnaire comprising four main constructs: knowledge, risk perception, attitude and NSI prevention practice. Data was collected from 250 respondents through a simple random sampling method. Descriptive statistics, Pearson correlation and multiple regression analysis were performed using SPSS to determine the relationship and significant influence of each variable. The findings revealed that knowledge, risk perception and attitude all have a positive correlation with NSI prevention practice. Multiple regression analysis has also shown that attitude has the strongest influence for NSI prevention practice, followed by knowledge and risk perception. In conclusion, this study highlights the factors that influence NSI prevention practice and reinforces the importance of promoting a positive attitude, enhancing risk perception and strengthening knowledge to improve NSI prevention practices amongst healthcare workers. The findings of this study can become a foundation for targeted interventions and educational programs to reduce the incidence of needlestick injuries.

Keywords: *NSI, needlestick injury, knowledge, risk perception, attitude, NSI prevention practice*

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List of Abbreviations

Healthcare workers	HCW
Needlestick Injury	NSI
Human Belief Model	HBM
Ministry of Health	MOH
Human Immunodeficiency Virus	HIV
Hepatitis B Virus	HBV
Hepatitis C Virus	HCV
Center for Disease Control and Prevention	CDC
World Health Organization	WHO
Personal Protective Equipment	PPE
Safety Engineered Devices	SED

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Needlestick injury (NSI) is defined as injuries caused by needles or sharps such as hypodermic needles, blood collection needles, intravenous stylets and needles used to connect parts of the intravenous delivery system (Rajender, 2022). NSI is considered as a serious occupational related injury among healthcare workers. NSI carries the risk of being infected by blood-borne pathogens such as human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV) and many more (Avnisha, 2025). According to Bouya et al., (2022), the global incidence of NSI is at 43 percent with the highest number of incidence located in the African region (51 percent) whereas the lowest number of incidence was located in the Western Pacific Region (31 percent). Bouya et al. also stated that amongst all of the blood-borne infections sustained by healthcare workers, 21 percent of Hepatitis C infection followed by 18 percent of Hepatitis B infection and 17 percent of HIV infection were due to NSI.

In Malaysia, NSI has been known as one of the important occupational hazards to healthcare workers. Much effort has been done to monitor and reduce NSI incidence amongst healthcare workers in both private and public sectors. Malaysian Ministry of Health (MOH) had released a manual on Sharp Injury Surveillance in 2007 as a part of its effort on monitoring and developing strategies in preventing and early management of NSI cases. According to a study by Yee et al. (2020) in her study, as much as 23.6 percent of nurses in Selangor had experienced NSI at

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workplace. On the other hand, in another study by Mohd Azman et al. (2020), he had found that 34.9 percent of house officers in HUKM had a history of NSI during practice.

As a part of the effort to reduce the risk and effects of NSI amongst healthcare workers, Center for Disease Control and Prevention (CDC) has outlined a guideline on Preventing Needlestick Injuries in Health Care Settings (CDC, 1999). Since then, this guideline has been globally adapted and integrated into the infection prevention and control modules for training throughout the world. The purpose of this guideline and training module is to inculcate safe working culture via the enforcement of safe practices in handling needles amongst healthcare workers (CDC, 1999) . In Malaysia, safe practices in handling needles are included as part of the curriculum for doctors, nurses, medical assistants and other medical related fields. In fact, this safe practices are taught and enforced through various programmes and training in both private and public healthcare settings. Safe practices in handling needles are essential to prevent the occurrence of NSI. This is supported by Mohd Azman et al. (2020) who had reported that house officers that experienced NSI while working had lower scores of safe practice compared to house officers who had never inflicted NSI.

There are many factors that contribute to the implementation of safe practice in handling needles to avoid NSI. Amongst them is knowledge. Knowledge is the theoretical or practical understanding of a subject which may be gained through information, education, training and experience (Smith, 2020). Having adequate knowledge on safe handling of needles is important as it ensures healthcare workers safety while performing procedures to avoid NSI. There are many researches that have proven the importance of knowledge in encouraging safe practice in needle

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handling to avoid NSI. For instance, Madhavan et al., (2019) concluded that teaching programs for risk reduction reduces the risk and effects of NSI amongst healthcare workers. This statement is also supported by Pandey et al., (2022) which reported a positive correlation between knowledge and practice in preventing NSI in his research.

Besides that, risk perception is also another important factor that influences safe practice amongst healthcare workers. According to Jones (2019), perception is the interpretation of any sensory information that has been provided to an individual . Perception varies amongst different individuals although they possess the same information. This is due to the fact that perception is usually influenced by other factors such as senses, experience, cultural background and beliefs. Obaoye (2021) found that there is a positive correlation between perception and practice among his respondents. Thus, despite having an averagely similar knowledge regarding the importance of safe practices in preventing needlestick injuries, different individuals tend to respond differently in regards to the implementation of safe practices, therefore yielding different results when it comes to NSI occurrences (Obaoye, 2021).

Subsequently, attitude is also another major factor that influences practice amongst healthcare workers. Thompson (2024) defined attitude as a psychological construct that encompasses an individuals' evaluations, feelings and predispositions towards objects, people or concepts. Attitude is usually influenced by an individual's knowledge, past experience, education or social influences. Having a good attitude is important as it will reflect on how much effort an individual is willing to give in order to achieve his/her target. Healthcare workers with a good attitude are prone towards being compliant with the safe practices in handling needles while performing

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procedures. Mohd Azman et al. (2020) and Timalsina and Anil (2022) both agree that there is a positive correlation between attitude and practice in preventing NSI occurrence at workplace.

In conclusion, there are many factors that influence healthcare workers towards implementing safe practice while working in order to prevent the occurrence of NSI. In this study, researcher wants to study the extent to which knowledge, risk perception and attitude significantly influence practice of healthcare workers in preventing needle stick injury at workplace.

1.2 Problem Statement

In this study, the researcher seeks to answer several research gaps. Firstly, there is an evidence gap seen between the findings of different studies by past researchers. There is a clear evidence gap seen in the relationship between knowledge and NSI prevention practice. According to the study from Obaoye (2021) and Timalsina and Anil (2022), they both had reported that the relationship between knowledge and NSI prevention practice was weakly positive whereas Pandey et al. (2022) reported it to be moderately positive. However, Mohd Azman et al. (2020) reported that there was no significant correlation between these two variables. This shows that there is an inconsistency of result findings amongst these three studies although they are using the same variable. Therefore, further research is required to understand further on the strength of the relationship between knowledge and practice in NSI prevention amongst healthcare workers.

There is also another evidence gap that can be identified in the study of the relationship between attitude and practice in NSI prevention. Studies from Timalsina and Anil (2022), Mohd Azman et al. (2020) and Alaridah (2022) had reported that there is a weak positive relationship between attitude and practice in NSI prevention. However, according to the study made by Al-Mugheed (2023), he had found that although his respondents had shown positive attitudes regarding NSI, they had low levels of needle stick practice. The difference in the results from these four findings shows that although the same variable is used, the result of the study is inconsistent. Therefore, further research is required to explore the direction and strength of the relationship between attitude and NSI prevention practice amongst healthcare workers.

Subsequently, there is also a knowledge void gap seen in the studies related to practice based on literature review. There is very few research that studies the relationship between risk perception and practice in NSI prevention. Study conducted by Pandey (2022), Mohd Azman et al. (2020) and Obaoye (2021) focuses on the relationship between knowledge and practice in NSI prevention whereas other researcher such as Al-Mugheed et al. (2023) and Alaridah (2022) had studied the relationship between attitude and practice in NSI prevention. Another study conducted by Erdachew (2023) looks for the relationship between socio-demography and behaviour towards practice. Therefore, it can be summarized that very limited study investigates the relationship between risk perception and NSI prevention practice amongst healthcare workers. As a result, further study needs to be conducted by using risk perception as the independent variable towards the practice in NSI prevention involving the healthcare workers in a public hospital in Malaysia.

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Another gap that can be identified in this practice in NSI prevention studies is the contextual gap. A significant contextual gap exists in current NSI prevention studies, particularly in terms of population representation and geographical location. In terms of population representation, many previous studies focus on specific subgroups of healthcare workers. For example, Yee et al. (2020) as well as Timalsina and Anil (2022) only uses nurses as their respondent whereas Mohd Azman et al. (2020) uses house officers as respondent. Similarly, Obaoye (2021) uses students of health and medical science faculty as the respondent. Due to the nature of population specificity that was used by previous researchers, it creates a narrow focus which limits generalisability of the study findings to the broader healthcare workforce. There are many other healthcare workers who are actively involved in procedures using needles that are not included in the studies such as medical doctors, medical assistants, phlebotomists, medical laboratory technologists and many more. Therefore, this study aims to include healthcare workers from various positions to represent healthcare populations as a whole.

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Moreover, differences in geographical locations also exist as another form of contextual gap. In terms of research location, the study from Timalsina and Anil (2022) was conducted in India, whereas study by Mohamud et al., (2023) was conducted in Somalia. In addition, study by Obaoye (2021) was conducted in Nigeria and study by Almoliky et al., (2024) as well as Alwabr (2018) was conducted in Yemen. All of these practices in NSI prevention studies were conducted at different locations which may contribute to the differences in study findings. These contextual differences may influence the outcomes due to variations in management systems, institutional policies and safety cultures. There is also a lack of studies conducted in

the Malaysian context, particularly at the district level which may limit the applicability of international findings to our local practice.

Additionally, there is also a practical gap seen related to NSI prevention practice based on the literatures available. Many studies conducted by various researchers regarding NSI prevention practices focus more on the cognitive and psychological factors such as knowledge (Timalsina and Anil, 2022; Obaoye, 2021; Pandey, 2022; Mohd Azman et al. 2020), attitude (Timalsina and Anil, 2022; Mohd Azman et al. 2020; Alaridah, 2022; Al-Mugheed, 2023) and risk perception (Obaoye, 2021) as an important determining factor towards NSI prevention practice amongst healthcare workers. Based on the findings from multiple research studies on factors affecting NSI occurrences and prevention practices, many programmes and activities were developed with the aim to effectively reduce the number of NSI occurrences. However, despite various preventive measures and safety training initiatives implemented in recent years, the occurrence of needlestick injuries (NSIs) among healthcare workers has shown little change. In 2024, there were 16 reported cases, representing a prevalence of 2.34 percent (23.4 per 1,000 healthcare workers). Similarly, 15 cases were recorded in both 2023 and 2022, each corresponding to a prevalence of 2.19 percent (21.9 per 1,000). These figures indicate that, although efforts have been made to reduce NSIs, the incidence has remained relatively constant over the past three years, suggesting that existing strategies may not be sufficiently effective or consistently applied.

Furthermore, a theoretical gap can also be identified based on previous studies. While many studies describe factors influencing NSI prevention practices, very few of these researchers had actually grounded their analysis based on a

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behavioural framework. This limits the depth of understanding as prior research tends to focus primarily on identifying statistical relationships between variables rather than exploring the underlying cognitive and decision-making process that promote safety behaviour. By merely examining correlations, these studies tend to overlook how tested variables such as knowledge, risk perception, attitude and other factors play a role in shaping behaviour among healthcare workers. In order to address this gap, this study intends to adopt the Health Belief Model (HBM) as its theoretical foundation to better understand not only factors influencing NSI prevention practice among healthcare workers, but also how these factors affect the development of safety behaviour among healthcare workers at the individual level.

1.3 Research Questions

1) Does knowledge significantly influence the needlestick injury prevention practice amongst healthcare workers?
2) Does risk perception significantly influence the needlestick injury prevention practice amongst healthcare workers?
3) Does attitude significantly influence the needlestick injury prevention practice amongst healthcare workers?

1.4 Research Objectives

1) To study the significant influence of knowledge towards needlestick injury prevention practice amongst healthcare workers.
2) To investigate the significant influence of risk perception towards needlestick injury prevention practice amongst healthcare workers.
3) To examine the significant influence of attitude towards needlestick injury prevention practice amongst healthcare workers.

1.5 Significance of the Study

Practical contribution

NSI remains as a common occupational injury sustained by healthcare workers in Malaysia. NSI carries a high risk of disease transmission and may impact healthcare workers' health and future. In conjunction to this, many efforts have been made by the hospital administrators, Ministry of Health (MOH) and the government in order to eradicate or minimise NSI occurrences. However, there are still a large number of healthcare workers inflicted by NSI each year despite the efforts that have been done. It is hoped that this research will be able to identify and point out factors that significantly influence NSI occurrences so that solutions can be more focused on the important factors.

At the hospital level, it is hoped that the research findings are able to point out important significant factors that lead to a better NSI prevention practice so that a more targeted and efficient prevention strategies can be implemented. The findings from this study may also help to provide evidence-based recommendations to the Ministry of Health (MOH) so that more comprehensive approaches such as NSI related policies and NSI prevention training modules can be further improved. At the national level, it is hoped that the findings of this study may also help the government in strengthening its national occupational safety agenda through the development of a long-term strategy and empowerment of legislation aimed to safeguard the safety of healthcare workers.

Empirical contribution

This study contributes to the body of knowledge by providing comprehensive analysis on the significance of knowledge, risk perception and attitude as factors in influencing NSI prevention practices amongst healthcare workers by using statistical analysis. The findings obtained from this study may offer some useful insight on the role that cognitive and psychological factors play in NSI prevention as well as providing evidence-based recommendations to improve interventions aimed at reducing NSI occurrences.

Theoretical contribution

This study offers theoretical contribution by integrating cognitive and psychological factors which are knowledge, risk perception and attitude into a single framework to provide a more comprehensive understanding on the components that are affecting behaviour in terms of needlestick prevention practices. By combining these factors, this study highlights how it interacts and collectively shapes healthcare workers' practice at workplace rather than viewing these factors as individual factors. This study also allows further understanding on the application of Health Belief Model (HBM) by applying its components such as perceived susceptibility, perceived severity and cues to action in the context of needlestick prevention practices amongst healthcare workers. Through this application, the study explores how HBM contributes to shaping preventive behaviours. In conclusion, this study deepens the theoretical understanding for developing effective behaviour based interventions aimed at reducing needlestick injury risks.

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1.6 Scope of the Study

The objective of this study is to investigate the significant influence between knowledge, risk perception and attitude towards practice while performing needle related procedures in order to prevent needlestick injury occurrence amongst healthcare workers. The independent variables of this study are knowledge, risk perception and attitude whereas the dependent variable is practice in NSI prevention. Although many guidelines and operational procedures are available for the purpose of preventing needlestick injury, yet needlestick injuries are still reported. This might be due to the variety of practices by healthcare workers while handling needles during procedure. This study aims to study the extent of influence and significance of knowledge, risk perception and attitude towards the differences of practice amongst healthcare workers in handling needles during procedure. These three independent variables were selected as they are widely known and most commonly cited as individual-level factors that influence behaviour in health related practices. These variables are chosen over other factors such as environmental factors or organizational influence because the focus of this study is to understand personal determinants which affect individual behaviour in NSI prevention.

This study is a quantitative cross-sectional study. The target group of respondents for this study are healthcare workers. These healthcare workers include doctors, nurses and medical assistants who are doing clinical work. Respondents were provided with a set of questionnaires via Google Form platform which included questions regarding knowledge, risk perception, attitude and practice regarding needle handling. This study was conducted in a public hospital located in Kedah, Malaysia. A public hospital was chosen due to its high patient volume and diverse healthcare workforce which may offer higher generalisability of study findings, and because

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Kedah represents a mix of urban and rural healthcare settings where limited similar study have been conducted previously.

1.7 Definition of Key Terms

NSI prevention practice

NSI prevention practice generally refers to the systematic implementation of protocols and guidelines which have incorporated protective measures in order to aid healthcare workers and shield them from the risk of NSI (Mohd Azman et al., 2020). Safe practice involves the combination of practicing proper needle handling technique, use of safety-engineered devices, compliance to protocols and work procedures as well as continuous education and training. Safe practices include proper disposal of needles, use of safety engineered devices and adherence to protocols (CDC, 1999). In this study, practice in NSI prevention refers to the procedural technique done by healthcare workers while doing needle related procedures.

Knowledge

Knowledge refers to the theoretical and practical understanding healthcare workers have regarding the safe handling of needles, the hazards associated with needle usage, the necessary precautionary steps, the appropriate way to use personal protective equipment (PPE) and the steps for reporting needlestick injuries. According to Alsaabani et al. (2022), knowledge is defined as healthcare workers' awareness of the definition of NSIs and the procedures and guidelines to follow after sustaining such an injury.

Risk Perception

Risk perception is people's judgement of future outcomes that may occur if they or other people follow a given course of action (Hoorens, 2020). Risk perception oftenly describes undesirable outcomes such as health and safety hazards at workplace or the magnitude of a certain risk. In this study, risk perception means a person's judgement towards the dangers of NSI and its related possible complications.

Attitude

Attitude is a global and relatively enduring evaluation of a person, object or an issue (George, 2006). Attitude refers to the tendency of an individual to act based on a certain idea, object or a person with the influence of our past experience, knowledge, education or emotion. According to Chen et al. (2020), attitude refers to healthcare workers' beliefs and feelings about the importance and effectiveness of safety measures for preventing NSIs. This encompasses their perceptions about the risks and benefits associated with following these safety practices.

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1.8 The Organisation of the Study

Chapter 1 describes the study's background, critical analysis on the problem statement, outlines research questions and objectives, defines the scope of the study and significance of the study as well as providing definition of the key terms for this study.

Chapter 2 discusses the literature reviews including introduction, occurrence and theory of NSI, practices in handling needles based on the universal precaution standard, underpinning theory involved and the relationship of knowledge, attitude and perception towards practice in preventing needlestick injuries.

In chapter 3, researcher explains the research methodology that is used in this study. This includes the research framework, initial hypothesis, design of this study, population and sampling method, data collection methods and procedure and techniques of analysis that are used in this study.

In chapter 4, researcher presents the overall findings of this study by providing detailed analysis of the collected data including the analysis of descriptive data before finally summarizing all of the findings.

In chapter 5, researcher summarise the key findings of the study and discuss on the important findings. Several recommendations and suggestions based on the study findings are also explored in this chapter.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature and theories related to the topic knowledge, risk perception and attitude towards practice in NSI prevention amongst healthcare workers. Literature discussed in this chapter also acts as a base knowledge and provides guidance towards developing the research framework.

2.2 Practice in NSI prevention amongst healthcare workers

Needlestick injury (NSI) is a non-intentional wound or injury that results from needles connected with intravenous (IV) and blood transfusion sets (Al Mugheed et al., 2023). NSI is an important occupational related injury that may occur in healthcare workers. The overall worldwide NSI prevalence was 40.97 percent among nurses, with the highest prevalence occurring in the Southeast Asia region which is 49.9 percent (Abdelmalik M. A., 2023). Initial concerns regarding NSI have started since the 1970s, primarily due to the concerns of possible transmission of blood-borne diseases such as HIV, HBV, HCV and many more (King, 2023). This has led to numerous studies and reports regarding NSI incidence and consequences among healthcare workers. There are many factors that may increase risk of NSI occurrence and it include elements such as professional inexperience, lack of training and education, improper management of sharps, types of devices used and procedures implemented, poor organizational climate, high workload and also fatigue (Dulon et al., 2020).

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Safe practice in NSI prevention generally refers to the systematic implementation of protocols and guidelines which have incorporated protective measures in order to shield healthcare workers from being inflicted with NSI. Safe practice involves the combination of practicing proper needle handling technique, use of safety-engineered devices, compliance to protocols and work procedures as well as continuous education and training (Mohd Azman et al., 2020). This is in accordance with the guidelines outlined by the CDC in 1999, safe practices include proper disposal of needles, use of safety engineered devices and adherence to protocols (CDC, 1999). This guideline has been globally adapted and is used as a baseline for the development of working procedures with needles and has been integrated in the training syllabus for healthcare workers. In Malaysia, safe practices are already included as part of the training curriculum for healthcare workers (Mohd Azman et al., 2020).

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Training about how needles should be handled and how to use safety devices is very important. Safety techniques during needle handling, disposal of the used needles, the need to follow the procedures and reporting of NSI incidence should be emphasized during education and training. This is to make sure that all the healthcare workers are well conversed with the working procedures and know what steps should be taken if NSI were to occur. This is supported by Alimohamadi et al. (2020) where he found that regular training sessions have been shown to reduce NSIs among healthcare workers significantly. Haque et al., (2020) also added that properly disposing needles in puncture-resistant containers immediately after being used is crucial as improper management of sharps disposal increases the risk of NSIs.

Another main element in safe practice is the availability of safety-engineered devices (SED). SEDs are developed with the purpose of protecting healthcare workers from NSI by integrating safety features in the devices to minimize risk of NSI occurrence. This is supported by a study made by Abdul Wahab (2019) in which he had reported a 53 percent reduction of NSI occurrence in Hospital Melaka upon the implementation of SED in needle-related procedures. This is further elaborated in a study conducted by Lawend et al. (2019) in which he had suggested that hospital units need to work in unison in making sure to equip their workers with the necessary tools that enhance infection control and improve universal precaution to prevent NSI occurrence. Availability of satisfactory equipment will help to direct to a proper working environment.

SEDs use safety mechanisms such as retractable needles, additional shielding and reuse prevention features. There are two categories of SED which are active and passive SEDs. Active SEDs require activation of the safety feature prior to use such as hinged needle cap or by pressing a button to activate the safety feature whereas passive SEDs do not require any activation as the safety feature will trigger by itself upon using the device. These devices include retractable needles, needleless systems, and shielded needles (Dulon, 2020). The use of SED has been proven to lower down NSI incidence significantly (Madhavan et al., 2019). By optimal utilisation of SED, implementing proper training and maximizing involvement between hospital management and healthcare workers in choosing safety devices, it may help to reduce NSI occurrence (Ottino, 2019).

Subsequently, compliance to safety protocols and procedures is also an important element in ensuring safe practice for NSI prevention. In general, many of

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the procedures regarding use and handling of needles have already included safety measures as part of the working process. Adherence to established protocols and guidelines are necessary. Healthcare institutions must ensure that all staff members are aware of and comply with these protocols (Suwanvanichkij et al., 2019). Compliance to safety protocol includes proper practice needle handling related procedures, adherence to standard procedures after needle related procedures such as disposal of used needles, reporting of NSI incidence and mandatory periodical follow up upon occurrence of NSI. Non-compliance to these safety protocols may hinder its objective to protect healthcare workers from NSI. Halil et al. (2022) had reported in his study that inconsistent use of personal protective equipment increased the occurrence of NSI. In terms of compliance to NSI protocol, several studies had reported that almost half of NSI incidents were not reported by healthcare workers. A study by Garus-Pakowska et al. (2019) had reported that 45.2 percent of injuries were not reported. This study finding is also supported by Alsaabani et al. (2022) in which only 47.3 percent of NSI occurrences were reported to the appropriate authorities. Lawend (2019) had also reported that only a minority of her respondents showed good compliance to the recommended universal precautions. This shows that there is generally poor compliance to safety protocol among the respondents in their study.

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2.3 Knowledge

Knowledge is a collection of information that is stored in the brain which can be retrieved, supplemented or reorganized and it is essential in performing mental functions, social behaviours and solving tasks or problems (Velzen, 2022). In the context of NSI prevention, Alsaabani et al. (2022), defined knowledge as healthcare workers' awareness of the definition of NSIs and the procedures and guidelines to

follow after sustaining such an injury. Key aspects of this knowledge include understanding the procedures and guidelines pertaining to NSI, and being aware of the implications of such injuries, vaccination and steps to be taken to prevent blood-borne disease transmission after NSI occurrence (Al Qadire, 2021). It includes familiarity with safety management practices, standard operating procedures, and the dangers of blood-borne microorganisms which includes HIV, HBV, and HCV. Having adequate knowledge on NSI prevention is vital to ensure healthcare worker's safety. A study by Abubakar et al. (2021) found that healthcare workers with higher knowledge levels about NSI prevention had significantly lower injury rates. This study shows that increased knowledge correlates with reduced NSI incidence at work. Knowledge can be ascertained through many ways. Educational interventions, including workshops, seminars, and e-learning modules, effectively increase knowledge and reduce NSIs (Cui et al., 2020).

One of the most popular methods to improve knowledge is through education. According to Zhang et al. (2018), the most prominent factor for NSI occurrence was not attending any training in regards to NSI prevention. Through structured educational programmes regarding NSI, healthcare workers are able to improve their knowledge on NSI prevention. Aljaloud et al. (2023) had reported that based on his study, the respondents' knowledge regarding NSI had significantly improved after attending a two week educational programme. Prior to the educational programme, more than half of his respondents had low knowledge regarding NSI prevention. However, upon attending a two week educational programme, the level of knowledge has increased by 91.2 percent. This statement was also supported by another study conducted by Patel (2018) in which she had reported that more than two-third of her respondents had good knowledge after an educational programme was implemented

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compared to the initial result where less than half of her respondents had satisfactory knowledge prior to the implementation of the training programme.

Another way to gain knowledge is by hands-on training programme and simulation based training. Based on a study by Wu et al. (2020), his virtual reality (VR) training programme had significantly improved the familiarity level and confidence level of his respondents. Wu et al. also reported that the majority of his respondents had significantly reduced levels of anxiety in regards to NSI prevention. This is because VR game training helps to provide appropriate exposure to trainees in experiencing the cognitive and integrative phases. Based on the results of a study by Mokoatle et al. (2025), as much as 23 percent of his respondents felt that they did not receive enough training in infection prevention and control. In another study by Saraswathy et al. (2021), significant difference was seen between the experimental and the control group in regards to hospital-acquired infection control practice after exposure to interprofessional simulation-based scenario training.

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2.3.1 Relationship between knowledge and practice in preventing NSI

There are several researchers who have explored the relationship between level of knowledge and how it affects healthcare workers' practice in preventing NSI. Based on a study conducted by Timalsina and Anil (2022), there is a positive correlation between knowledge and practice among staff nurses. This finding is identical to another study that was done by Tawalbeh et al. (2019) where he had reported on the significant positive correlation between knowledge and adherence to standard precaution among nursing students. Timalsina and Anil (2022) also

concluded that by improving the level of knowledge, we are able to improve practice in NSI prevention.

In addition, according to Pandey et al. (2022), there is a moderately positive relationship between knowledge and NSI prevention practice among her respondents. This is also supported by Al-Mugheed et al. (2023) in which the he concluded that there is a low level of NSI occurrence among students with good knowledge and attitude. However, this contradicts with Mohd Azman et al. (2020) in which he concluded in his study that there is no significant relationship between knowledge and practice of universal precaution. Mohd Azman however commented that there is a limitation in his study as his respondents are house officers working in a busy university hospital, which may have contributed to respondents to ignore universal precautions despite having good knowledge in NSI prevention.

Healthcare workers that did not get adequate training on infection prevention has double the risk of getting exposed to sharp injury compared to adequately trained healthcare workers (Gelchu, 2020). The finding is also identical to a study by Zhang et al. (2018) among nursing students in which he reported that the prevalence rate of NSI was 78.4 percent among those who did not have attended any safety training and 70.5 percent among those who did not know about occupational safety management policy. Both of these studies show that low levels of knowledge contributes to higher prevalence rate of NSI occurrence. Based on a systematic review by Mengistu et al. (2020), the risk of NSI is significantly increased in healthcare workers who had not attended training in safety and prevention. This statement is also supported by Tawalbeh et al. (2019) in which he also concluded in his study that by implementing an infection control teaching course, it will help to improve knowledge regarding NSI prevention and encourage compliance with universal precaution practices among

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nursing students. Insufficient training courses will result in reduced knowledge and awareness in adopting preventive behaviors.

Healthcare workers with higher knowledge about NSI has better adherence to safety practices. The study emphasizes that training and educational programs significantly improve the knowledge base of healthcare workers, thereby enhancing their adherence to safe practices (Al-Mugheed et al., 2023). This aligns with Alinejad et al. (2023) who found that simulation based training sessions enhances the compliance of nurses towards preventive measures. This conclusion is also confirmed by Amlak et al. (2023) who stated that a comprehensive awareness of the risks and preventive strategies related to NSIs results in an increased adherence to safety practices

2.4 Risk perception

Perception is a psychological process in which through personal experiences, an individual can process responses into negative or positive perceptions. Perception shapes how an individual processes the information or knowledge that has been gained based on pre-existing experiences. According to Jones (2019), perception is the interpretation of any sensory information that has been provided to an individual . Perception varies amongst different individuals although they possess the same information. This is due to the fact that perception is usually influenced by other factors such as senses, experience, cultural background and beliefs. However, according to Hoorens et al. (2020), risk perception is people's judgement of future outcomes that may occur if they or other people follow a given course of action. Risk perception oftenly describes undesirable outcomes such as health and safety hazards at workplace or the magnitude of a certain risk.

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According to Hoorens et al. (2020), risk perception involves estimating the potential magnitude of risk and determining its acceptability. This information is essential in order to understand why people take specific actions in the face of potential dangers despite objective safety. Hoorens also highlighted that risk perception can occur through two fundamentally different modes: the analytical and the experiential.

The analytical mode is systematic and logical, involving deliberate consideration of various dimensions of risk, such as the likelihood of events and their potential utility. This mode aligns with traditional models of decision-making that assume rational behavior based on statistical rules. For example, when evaluating the risk of a skiing accident, an individual might assess past incident rates and potential consequences in a methodical manner. In contrast, the experiential mode is intuitive and emotional, driven by affective responses to the risk in question. This mode is often faster and relies on immediate emotional reactions rather than detailed analysis. For instance, strong emotional reactions, time pressure, and reduced cognitive resources can lead individuals to base their risk evaluations on how an activity makes them feel, rather than on systematic consideration of potential outcomes (Hoorens et al. 2020).

There are many factors that influence an individuals' perception. These include personal experience, training and work environment. Healthcare workers who had history in experiencing and witnessing NSI will have better risk perception towards NSI compared to inexperienced colleagues. According to Alfulayw et al. (2021), healthcare workers who had previously suffered from NSI showed greater awareness and heightened perception which leads to better compliance to safety

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protocols. Similarly, Almoliky et al. (2023) found out in his study that nurses who had at least 10 years of experience had lower engagement of needlestick and sharp injuries compared to those without experience. Nurses with experience in NSI are more likely to recognize dangers associated with needle and related procedures and are more likely to take precautionary measures.

Good safety culture environment also plays an important role in affecting an individual's risk perception towards NSI prevention. This is evidently supported by Anandadurai et al. (2024), in which the result of his study shows that lab technicians have better perception in comparison with other categories of job. This is mainly due to the nature of work in which lab technicians work are exposed to blood-borne pathogens on a daily basis. Therefore, the level of awareness and risk perception is higher among them. This shows that the working environment has an impact towards developing good risk perception amongst healthcare workers.

The transformation of knowledge into practice requires a supportive perception of workplace safety and adherence to safety protocols. Training programs that highlight the risks associated with NSIs and their consequences can enhance risk perception among healthcare workers (Liu et al., 2021). Healthcare workers who perceive NSIs as severe are more likely to implement safety practices. Moreover, Yadav et al. (2020) had found that healthcare workers with good risk perception oftenly have better compliance to safety measures. Based on the result of these studies, risk perception plays an important role in preventing NSI. Risk perception allows healthcare workers to understand the importance of utilizing their knowledge on universal precaution and promotes adherence to standard protocols in needle handling.

2.4.1 Relationship between risk perception and safe practice in preventing NSI

There are many studies done to look for the influence of risk perception and how risk perception affects NSI occurrence. For instance, a study by Obaoye (2021) had reported a positive correlation between risk perception and practice among healthcare workers. This is also supported by Alinejad et al. (2023) in which he had found that the post intervention group had shown an increase in compliance due to heightened perceived severity and sensitivity regarding NSI. Both of these studies agree that those with a higher perception of the risks associated with NSI are more likely to comply with safe practices.

There are also researchers who studied the relationship between risk perception and practice in preventing NSI by observing the adherence to standard universal precaution protocols (Madhavan et al., 2019). Based on these studies, researchers concluded that high-risk perception typically correlates with better adherence to safety practices and lower injury rates (Anandadurai et al., 2024; Alinejad et al., 2023; Almoliky et al., 2024). For instance, a cross-sectional study in Taiz, Yemen, revealed that 95.36 percent of nurses experienced NSIs, with a notable lack of post-injury reporting and management practices (Almoliky et al., 2024). This high incidence rate is partly attributed to poor risk perception (Al-Moliky et al., 2024). Similarly, Bouya et al. (2022) also concluded in his study that positive perception of safety in the workplace encourages reporting and prevention of NSIs. In another study conducted by Madhavan et al. (2019), respondents who have high risk perception also show increased adherence to safety measures in NSI prevention. In general, all of these studies support that there is a positive and significant relationship

between risk perception and adherence to safety protocols as part of safe practice in NSI prevention.

There are also several studies that studies the relationship of risk perception as a factor that connects knowledge and attitude with safe practice in NSI prevention. According to Nashwan et al., (2020), educational interventions that increase risk perception can lead to improved practices. Programs that emphasize the dangers of NSIs and the importance of preventive measures have been effective in reducing injury rates.

2.5 Attitude

In psychology, attitude is a complex mental state involving beliefs, feelings, values, and dispositions to act in certain ways (McLeod, 2023). Attitude is a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor. Attitudes are central to understanding human behavior and are often studied in the context of how they influence actions, especially in social settings.

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In the context of NSI prevention among healthcare workers, many researchers have studied the relationship between attitude and NSI prevention practices (Yazid et al., 2023; Alinejad et al., 2023; Alsabaani et al., 2022). According to Chen et al. (2020), attitude refers to healthcare workers' beliefs and feelings about the importance and effectiveness of safety measures for preventing NSIs. This encompasses their perceptions about the risks and benefits associated with following these safety practices. Whereas Abuduxike et al. (2021) defined attitude as the degree of positive or negative evaluation in which healthcare workers feel regarding standard precautions in preventing NSIs.

ABC model of attitudes by Ostrom (1969) is a framework that is commonly used by psychologists to describe the components of attitude (McLeod, 2023). Based on the ABC model of attitude, attitude is divided into three main components namely the affective component (AC), behavioral component (BC) and cognitive component (CC). Affective component is a person's feeling or emotion towards an object such as fear, anger, dislike and many more. Behavioral component refers to how a person is inclined to behave in a certain way towards a certain object, person or issue. Cognitive component refers to the prior knowledge, belief or thought that a person has obtained regarding the object, person or an event. These three components collectively contribute to the development of a person's attitude towards an object, person or event (McLeod, 2023).

The ABC model of attitude provides further understanding on how an attitude is developed. By identifying the factors that influence attitude, appropriate interventions can be designed in order to promote a healthy attitude towards NSI prevention. A study conducted by Crawford (2022) had shown that by modifying these affect, behavioral and cognitive components, attitude can be modified in order to foster a more positive attitude. In the context of NSI, many researchers are studying the effects of modification in risk perception as the cognitive component and knowledge as the affect component among healthcare workers to improve practice in NSI prevention. For instance, Pandey et al. (2022) investigated the relationship between knowledge and preventive practice, highlighting that modification in knowledge as an affect component may also improve healthcare workers' tendency towards compliance to NSI prevention practices. In another study, both Al-Mugheed et al. (2023) and Yazid et al. (2023) examined the role of risk perception as a cognitive component and had found that healthcare workers with higher perceived

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susceptibility and severity of NSI were less likely to experience NSI incidents. These researchers study the relationship between cognitive and affect component modifications whether it is effective in improving healthcare workers attitude that is expressed via the adherence to safe practice in NSI prevention.

Based on the studies available, a more comprehensive understanding of attitude can be achieved. This will help stakeholders and all parties relevant to formulate a more efficient method of training and education to boost positive attitude among healthcare workers. Therefore, safe practice in NSI prevention can be further promoted to ensure the safety of all healthcare workers and reduce the number of NSI occurrences.

2.5.1 Relationship between attitude and safe practice in preventing NSI

Many studies regarding the relationship between attitude and safe practice in NSI prevention have been done. A study conducted by Mohd Azman et al. (2020) among house officers in a university hospital has also shown that there is a positive correlation between attitude and practice. This result is similar to another study by Timalsina and Anil (2022) also concluded that there is a positive relationship between attitude and practice in their study among staff nurses in India. In addition, Alaridah et al. (2023) had also reported similar findings amongst her respondents. All of these researchers generally agree that attitude also plays an important role in developing good practice in NSI prevention among healthcare workers.

There are also few researchers who studied the relationship between attitude and its effect towards healthcare workers' adherence to standard universal precaution. For instance, Pandey et al. (2022) had found in his study that there is a moderate positive correlation between knowledge and expressed practices regarding NSIs,

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suggesting that attitudes, influenced by knowledge, play an important role in determining practice. Similarly, Yazid et al. (2023) also concluded that nurses with positive attitudes show positive behaviour on proper wound washing and incident reporting. Ali et al. (2023) also studies his respondents adherence to standard universal precaution such as needle recapping, vaccination and utilization of protective equipment as a tool for measurement to analyze the level of knowledge and attitude among his respondents.

However, some researchers that study the relationship between attitude and expressed practice among healthcare workers have obtained a negative relationship between these two variables. Al-Mugheed et al. (2023) has demonstrated in his study that despite having positive attitudes towards NSI prevention, nursing students reported low levels of safe practices. This indicates a gap between attitude and practice, suggesting that positive attitudes alone are insufficient without proper practice implementation and continuous education. Similarly, Alsabaani et al. (2022) also found that while a majority of healthcare workers had positive attitudes towards NSI prevention, including the importance of immediate reporting and the belief that NSIs are preventable, a significant proportion still engaged in unsafe practices like recapping needles. This indicates a discrepancy between attitudes and actual practices, highlighting the need for better implementation of safety protocols.

Other numerous researchers also examined the role of attitude as a mediator to safe practice in NSI prevention. For instance, Sharma et al., (2020) had found that attitudes may have an impact on behavioral intentions, which subsequently determines actual practices. Healthcare workers who have a high intention to prevent NSIs have greater adherence to safety practices. In another study by Tan et al. (2019),

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he had found that interventions that seek to change attitude towards NSI prevention like motivational interviewing and positive reinforcement were found to increase compliance to safe practices. Similarly, Garus-Pakowska et al. (2019) had also discovered that individuals with higher knowledge are more concerned of their own health and therefore have better attitudes. This results in improved compliance with the standard precaution practice in the prevention of NSI. This study also shows that attitude is an effective mediator between knowledge and it facilitates the improvement of practice in NSI prevention among healthcare workers.

2.6 Related Underpinning Theories

According to the Health Belief Model (HBM), risk perception refers to a person's assessment of the possibility and seriousness of a specific health threat. The HBM is a psychological framework that is used to explain and predict health-related behaviors by studying how a person perceives risks and effectiveness of preventive actions. According to HBM, risk perception is shaped primarily by perceived susceptibility, which is a person's belief in the likelihood of health issues to occur, and perceived severity, which is a person's belief on how serious the health issue may become. In the context of needlestick injuries amongst healthcare workers, knowing how susceptible they are toward NSI occurrence and knowing how severe NSI may affect them later in life will help to shape their perception and influence them towards NSI prevention practices.

HBM also helps to explain how attitude influences preventive behaviour. In the context of NSI, attitude can be seen as an individual's overall evaluation, belief and emotional response towards NSI prevention practices. Healthcare workers who understand how susceptible they are towards NSI occurrence, perceives NSI

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consequences as serious and believes that the benefits of preventive measures outweighs its barriers will most likely develop a positive attitude towards NSI prevention practices. This positive attitude helps healthcare workers to turn their concerns and perception about NSI into preventive actions. Therefore, attitude becomes a key determinant whether healthcare workers choose to adopt or ignore NSI prevention practices and it acts as a mediator to bridge the gap between risk perception and preventive behaviour.

Although knowledge is not a formal construct of HBM, it plays a both direct and supporting role in promoting preventive behaviours. Adequate knowledge increases healthcare workers' understanding and competence, thereby directly encouraging safe practices while also shaping risk perception and attitude. In the context of NSI prevention, healthcare workers must possess adequate knowledge about transmissible blood-borne diseases and modes of transmission, severity of the diseases, potential health consequences and the effectiveness of preventive strategies in NSI prevention. This knowledge not only strengthens their engagement in NSI preventive practices by improving their understanding of the effectiveness and importance of preventive actions, but also shapes their perceived susceptibility and severity and helps them to weigh the balance between benefits of preventive action and perceived barriers towards NSI preventive practices. Without adequate knowledge, healthcare workers may develop a poor sense of danger and will tend to underestimate the importance of NSI preventive practices resulting in low risk awareness and less likely to engage in NSI prevention practices.

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Key components of risk perception in the context of the Health Belief Model include:

1. **Perceived Susceptibility**: This aspect of risk perception relates to a person's belief regarding their vulnerability to a particular health threat. For example, in the case of needlestick injuries (NSIs), healthcare workers may assess their own likelihood of experiencing an NSI based on factors such as their job responsibilities, the frequency of exposure to needles, and their skills in handling sharps safely.
2. **Perceived Severity**: This component concerns an individual's evaluation of the seriousness of the consequences of a threat. In the context of NSIs, perceived severity includes considerations of the potential outcomes such as transmission of diseases, the need for medical treatment, and the impact on one's health and professional life.
3. **Perceived Benefits of Action**: According to the HBM, a person is more likely to take preventive actions if they believe that these actions can effectively reduce their risk or minimize the severity of potential health consequences. For NSI prevention, perceived benefits may include the effectiveness of using safety-engineered devices, wearing personal protective equipment (PPE) and complying to safe practices in reducing the risk of NSIs.
4. **Perceived Barriers to Action**: This aspect refers to a person's assessment of the obstacles or costs associated with adopting preventive behaviors. Barriers to NSI prevention may include factors such as the availability of safety devices, time constraints during procedures, discomfort associated with wearing PPE, and perceived inconvenience of adhering to safety protocols.
5. **Cues to Action**: According to the HBM, cues to action are triggers that causes individuals to implement measures to lower their risk or susceptibility to a

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health threat. Cues to action in NSI prevention may include training sessions on sharps safety, reminders in healthcare settings, feedback from colleagues or supervisors, and institutional policies promoting safe practices.

Overall, risk perception according to HBM is a critical determinant of health-related behaviors, including the adoption of preventive measures to reduce the risk of health threats such as NSIs among healthcare workers. By understanding and addressing healthcare workers' perceptions of risk and the factors influencing their beliefs, healthcare organizations can develop targeted interventions and strategies to promote a safer work environment and improve adherence to NSI prevention guidelines.

In summary, the Health Belief Model (HBM) provides a relevant theoretical framework for this study by supporting the role of knowledge, risk perception and attitude as an influencing factor towards preventive behaviour.

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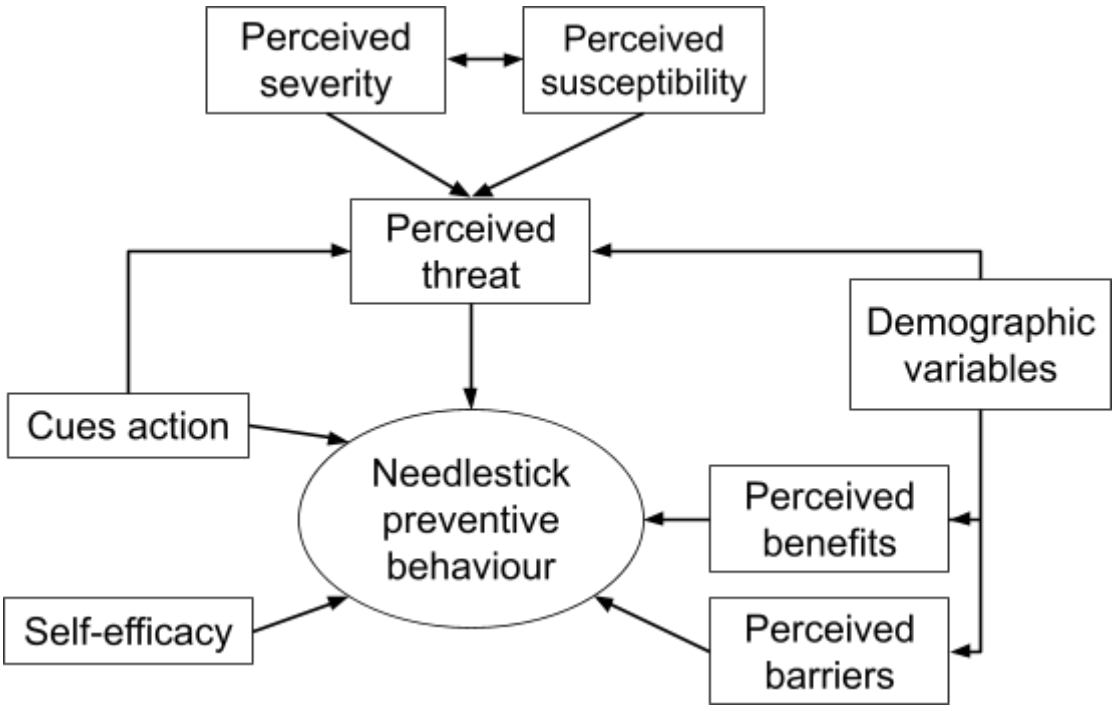

Figure 2.1
The *Health Belief Model*
Source: Fathi et al., 2017

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2.7 Summary of the Chapter

In summary, NSI is globally acknowledged as an important occupational hazard among healthcare workers. The causes of NSI occurrence are multifactorial. Many researchers have studied the role of knowledge, risk perception and attitude in promoting safe working practice with the hope that it could reduce the number of NSI occurrences. Although many studies have been done, there is still room for future research to further enhance our knowledge and improve our current method in promoting safe practice in NSI prevention.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research design, sample and population, data collection method and techniques for data analysis. Techniques that are being used for data analysis are also discussed in detail. This chapter also explains the underpinning theory and the research framework of this study.

3.2 Research Framework

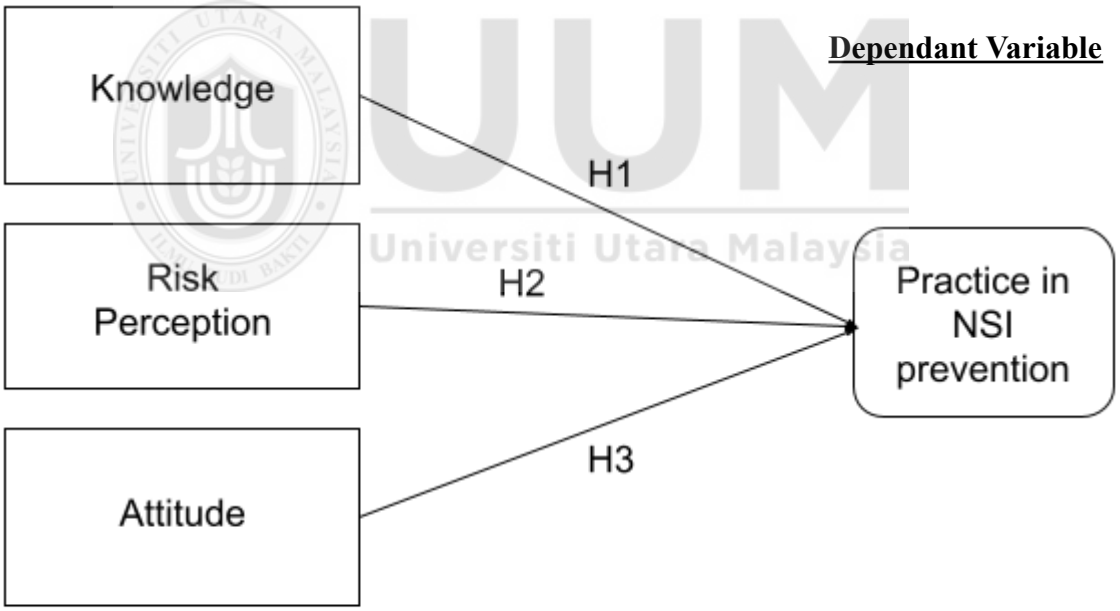

Figure 3.1

Conceptual Framework of the Influence of Knowledge, Risk Perception and Attitude towards Needlestick Injury Prevention Practice at Work.

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3.3 Hypotheses Development

The hypothesis for this study is derived from the research objectives and research questions to investigate the significant influence between knowledge, perception and attitude towards practice amongst healthcare workers in preventing needlestick injury occurrences.

H_1: Knowledge significantly influences the needlestick injury prevention practice amongst healthcare workers.

H_2: Risk perception significantly influences the needlestick injury prevention practice amongst healthcare workers.

H_3: Attitude significantly influences the needlestick injury prevention practice amongst healthcare workers.

3.4 Research Design

According to Ishtiaq (2022), a quantitative study is a research method which involves the analysis of data or information that is descriptive in nature and subsequently quantified. This research paper uses quantitative cross-sectional design to investigate the significant influence of knowledge, risk perception, and attitude towards the NSI prevention practice among healthcare workers. Data was collected using structured questionnaires distributed to a sample of healthcare workers in a tertiary hospital in Southern Kedah.

3.5 Operational Definition

Needlestick Injury Prevention Practice: The procedural techniques performed by healthcare workers while handling needle-related procedures, measured on a 5-point

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Likert scale ranging from ‘Strongly Disagree’ to ‘Strongly Agree’, with higher scores indicating a better adherence to needlestick injury prevention practices.

Knowledge: The theoretical and practical understanding of needlestick injury prevention, measured on a 5-point Likert scale ranging from ‘Strongly Disagree’ to ‘Strongly Agree’, with higher scores indicating a higher level of knowledge regarding needlestick injury prevention.

Risk Perception: The healthcare workers' interpretation of the risks associated with needlestick injuries, measured on a 5-point Likert scale ranging from ‘Strongly Disagree’ to ‘Strongly Agree’, with higher scores indicating a greater perceived risk towards experiencing a needlestick injury.

Attitude: The healthcare workers' tendencies to act in a certain way regarding needlestick injury prevention, measured on a 5-point Likert scale ranging from ‘Strongly Disagree’ to ‘Strongly Agree’, with higher scores indicates a more positive attitude towards prevention practices.

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3.6 Measurement of Variables/Instrumentation

This study uses a structured, self-administered questionnaire via Google Form platform to assess for the item NSI prevention practice, knowledge, risk perception and attitude of the respondents. All items were adapted from previously established instruments in previous studies and was modified to suit the local context. To improve respondents’ comprehension, the questionnaire was provided in bilingual format (English and Bahasa Melayu).

A five point Likert scale was used for all items ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

3.6.1 Questionnaire Development

Each item in the questionnaire was developed by adapting items from previous validated instruments as the following:

- NSI prevention practice : Saleem et al. (2010)
- Knowledge : Vinodkumar et al. (2010)
- Risk Perception : Min Swe et al. (2014)
- Attitude : Alsabaani et al. (2022)

Each item was reviewed and modified for clarity and contextual relevance. The questionnaire was then translated into Bahasa Melayu using back to back translation to ensure consistency and accuracy of the translation.

3.6.1.1 Practice in NSI prevention

Table 3.1
Item of Practice

Original Question	Modified Question	Bi language/Bahasa Melayu
Regular use of gloves.	I need to practice regular use of gloves when handling needles.	Saya perlu sentiasa mengamalkan pemakaian sarung tangan ketika mengendalikan jarum suntikan.
Regular use of tray to keep syringes.	I need to practice regular use of tray to keep syringes.	Saya perlu sentiasa menggunakan tray sebagai tempat letak picagari.
Regular use of sharp disposal containers.	I need to practice regular use of sharp disposal containers after using needles.	Saya perlu menggunakan bekas pelupusan sisa objek tajam untuk membuang jarum setelah digunakan.
Received sharps related training.	I am interested in receiving needle handling related training.	saya berminat untuk menyertai latihan berkaitan pengurusan jarum yang telah digunakan.
Avoidance of needle recapping.	I need to avoid needle recapping after use.	Saya perlu elakkan amalan menutup semula jarum suntikan selepas digunakan.

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Table 3.1 (continued)

Original Question	Modified Question	Bi language/Bahasa Melayu
Avoid breaking needles by hand.	I need to avoid breaking needles using hand	Saya perlu elakkan amalan mematahkan jarum suntikan menggunakan tangan.
Hepatitis B vaccination	I have received Hepatitis B vaccination.	Saya telah menerima suntikan vaksin Hepatitis B.

Source: Saleem et al., 2010

3.6.1.2 Knowledge among healthcare workers regarding NSI prevention

Table 3.2
Item of Knowledge

Original Question	Modified Question	Bi language/Bahasa Melayu
I know how to perform my job in a safe manner.	I know how to use needles safely.	Saya tahu bagaimana untuk melaksanakan tugas saya dengan selamat.
I know how to use safety equipments and standard work procedures.	I know how to use personal protective equipment (gloves) and standard working procedures in needle handling.	Saya tahu cara menggunakan peralatan pelindung diri (sarung tangan) dan prosedur kerja standard berkenaan pengurusan jarum.
I know how to maintain or improve workplace health and safety.	I know how to maintain or improve my workplace health and safety.	Saya tahu cara mengekalkan atau meningkatkan kesihatan dan keselamatan di tempat kerja saya.
I know how to reduce the risk of accidents and incidents in the workplace.	I know how to reduce the risk of needle stick injury.	Saya tahu bagaimana cara untuk mengurangkan risiko kecederaan akibat tertusuk jarum.
I know what are the hazards associated with my jobs and the necessary precaution to be taken while doing my job.	I know what are the hazards associated with my job and the necessary precaution to be taken while using needle.	Saya tahu apakah bahaya yang berkaitan dengan pekerjaan saya dan langkah berjaga-jaga yang perlu diambil semasa bekerja menggunakan jarum.
I don't know what to do or whom to report if a potential hazard is noticed in my workplace.	I don't know what to do or whom to report if I notice any potential of hazard needle stick injury.	Saya tidak tahu apa yang perlu dilakukan atau kepada siapa yang perlu dilaporkan jika saya melihat sebarang potensi bahaya tertusuk jarum di tempat kerja saya.

Source: Vinodkumar et al., 2010.

3.6.1.3 Risk perception among healthcare workers regarding NSI prevention

Table 3.3
Item of Risk Perception

Original Question	Modify	Bi language/Bahasa Melayu
Every health care workers has chance to get needle stick injury	Every health care workers has chance to get needle stick injury	Semua kakitangan kesihatan terdedah kepada risiko kecederaan tusukan jarum suntikan.
Needle stick injuries are unavoidable things for health care workers	Needle stick injuries is an unavoidable risk for health care workers	Kecederaan tusukan jarum suntikan adalah risiko yang tidak dapat dielakkan di kalangan kakitangan kesihatan.
Increase workload can lead to needle stick injury	High workload can lead to needle stick injury	Beban kerja yang tinggi boleh menyebabkan kecederaan tusukan jarum.
If health care workers get infected with HIV infection, should they resign from their profession?	The health care workers should not resign from their profession if they get infected with HIV infection.	Kakitangan kesihatan tidak seharusnya meletakkan jawatan daripada profesion mereka jika mereka dijangkiti jangkitan HIV.
The infection transmitted from needle stick injuries are life threatening	The infection transmitted from needle stick injuries are life threatening	Jangkitan yang ditularkan daripada kecederaan tusukan jarum suntikan boleh mengancam nyawa
Although there is a risk of infection, confident and skilfulness can prevent injury	Although there is a risk of infection, my confidence and working skill can help me to prevent needlestick injury	Walaupun terdapat risiko jangkitan, keyakinan dan kemahiran saya boleh membantu mengelakkan terjadinya kecederaan tusukan jarum suntikan
We haven't learned about standard precaution for needle stick injury	I haven't learned about standard precaution for needle stick injury	Saya belum pernah belajar tentang piawaian langkah berjaga-jaga (standard precaution) untuk mengelakkan kecederaan tusukan jarum suntikan.
Unavailability of protective equipment can predispose a person to get needle stick injuries	Unavailability of protective equipment can predispose a person to get needle stick injuries	Ketiadaan peralatan perlindungan diri boleh menyebabkan seseorang terdedah kepada kecederaan akibat tusukan jarum suntikan.

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Table 3.3 (Continued)

Original Question	Modify	Bi language/Bahasa Melayu
Handle needle without wearing glove is better than wearing glove	Handling needle without wearing glove is better than wearing glove	Mengendalikan jarum tanpa menggunakan sarung tangan adalah lebih baik berbanding dengan menggunakan sarung tangan.
Reporting after needle stick injury is not much useful	Reporting needle stick injury is not much useful	Melaporkan kecederaan tusukan jarum suntikan adalah tidak begitu bermanfaat.
Every health care worker should be immunized with Hepatitis B vaccine	Every health care worker should be immunized with Hepatitis B vaccine	Semua kakitangan kesihatan perlu diimunisasikan dengan vaksin Hepatitis B..

Source: Min Swe et al., 2014.

3.6.1.4 Attitude among healthcare workers regarding NSI prevention

Table 3.4
Item of Attitude

Original Question	Modify	Bi language/Bahasa Melayu
I am worry about having needle stick injury	I am worried about having needle stick injury	Saya risau sekiranya terjadi kecederaan tusukan jarum kepada saya.
Patient care is more important than the safety of HCWs	Patient care is more important than the safety of health care workers.	Keselamatan pesakit adalah lebih penting dari keselamatan kakitangan kesihatan.
All sharps injuries at work should be reported immediately.	All needlestick injuries at work should be reported immediately.	Semua kejadian kecederaan akibat tusukan jarum perlu dilaporkan dengan segera.
I think needle stick injury is preventable.	In my opinion, needle stick injury is preventable.	Saya rasa kecederaan akibat tusukan jarum boleh dielakkan.
Sharp objects waste should be disposed of by a professional company not in domestic waste.	Sharp objects waste should be managed by a professional company instead of a common domestic waste company.	Sisa objek tajam hendaklah dilupuskan oleh syarikat yang profesional dan bukan secara pengurusan sisa sampah yang biasa.

Source:Alsabaani et al., 2022.

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3.6.2 Content Validity

Content validity was done through questionnaire evaluation by an academic expert as well as an expert in the fields of occupational safety and health. According to Gomez et al. (2020), it is recommended that content validity should be done by at least two evaluation experts. Each panel reviewed the questionnaire items for clarity and relevance to the study objectives. Each panel assessed the construct of knowledge, risk perception, attitude and NSI prevention practice. Based on the feedback, these items were revised, simplified or modified to ensure accuracy of translation and content relevance.

Each panel independently evaluated the questionnaire item using a 4 point relevance scale. The relevance of each item was determined by calculating the Item-Level Content Validity Index (I-CVI) and Scale-Level Content Validity Index (S-CVI/Ave) using Excel. The I-CVI values for all questionnaire items were rated between 0.5 to 1.0. Out of 31 questions, 18 (58 percent) achieved a perfect I-CVI score of 1.0 and none of the questions scored 0.0. However, several items had low ratings primarily due to variation in perceived clarity or contextual relevance.

In addition to quantitative ratings, both panel experts had also provided qualitative feedback regarding the clarity, understandability and relevance of the questionnaire items. The academic expert, Assoc. Prof. Dr. Zuraida Hassan had suggested revision of certain words to improve its clarity and relevance. She had also suggested some minor revision in the English-to-Malay translations in order to improve understandability of the respondents. The field expert, Dr Nurul Akmal agreed with the overall relevance of the questionnaire items and deemed the questionnaire items as appropriate to the topic. These questionnaire items were then

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revised based on the panel feedback which included suggestions to simplify phrasing, clarifying medical terminology and improvement in English to Malay translation.

The score for S-CVI/Ave was 0.79 and was slightly low from the acceptable threshold level of 0.8 (Polit and Beck, 2006). According to Yusoff (2019), revalidation is not always necessary after minor revisions when expert suggestions are fully incorporated and item construct remains intact. Therefore, despite the slightly lower S-CVI/Ave score, the questionnaire was revised accordingly and proceeded with pilot testing to further assess its reliability. The summary of the content validation result is presented in the table below.

Table 3.5
I-CVI and S-CVI/Ave rating for Content Validity

Item	I-CVI	S-CVI/Ave
K1	1	0.79
K2	1	
K3	1	
K4	1	
K5	1	
K6	1	
RP1	1	
RP2	0.5	
RP3	1	
RP4	1	
RP5	1	
RP6	0.5	
RP7	0.5	
RP8	1	
RP9	1	
RP10	1	
RP11	0.5	

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Table 3.5 (Continued)

Item	I-CVI	S-CVI/Ave
RP13	1	
A1	0.5	
A2	0.5	
A3	0.5	
A4	1	
A5	0.5	
P1	0.5	
P2	0.5	
P3	0.5	
P4	1	
P5	0.5	
P6	1	
P7	1	

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3.6.3 Pilot Testing

According to Surucu & Maslakci (2020), the use of a valid and reliable measuring instrument is essential in determining the quality of a research. This is usually obtained by conducting a pilot study. According to Ruel et al. (2016), pilot studies are conducted to test the entire research process, commonly from a methodological standpoint in actual field conditions with the purpose of identifying potential problems as well as assessing whether or not the study is feasible, realistic and rational.

In this study, a pilot study was done using 30 respondents to evaluate clarity and reliability of the questionnaire items. This sample size was taken based on the

Central Limit Theorem, which recommends a minimum of 30 participants for preliminary analysis.

For this study, a pilot test was conducted before the questionnaire was distributed in order to assess the reliability and clarity of the questionnaire. A total of 30 healthcare workers from a different public hospital and healthcare centers were recruited to participate in the pilot study. This group shares similar characteristics with the target population as they are also healthcare workers performing needle-related tasks daily. The results for this pilot study were excluded from the main data to avoid sampling contamination.

The pilot study aimed to evaluate internal consistency of the instruments as well as to identify any ambiguity, confusion or misunderstanding in the question items. Respondents were also encouraged to provide suggestions on the wording to improve clarity and understanding of the question items.

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3.6.4 Reliability Testing

Reliability analysis was performed using Cronbach's alpha to assess internal consistency for each construct. The results were as the following:

Table 3.6
Reliability Coefficient of Questionnaire

Item	Cronbach's Alpha	Number of item
Practice	0.821	7
Knowledge	0.788	6
Risk Perception	0.885	13
Attitude	0.706	5

All constructs achieved an average Cronbach's alpha of 0.898, indicating good reliability (Nunally & Bernstein, 1994). The instrument was therefore deemed reliable and suitable for use in the main study.

3.7 Data Collection

Data was collected from May 2025 to June 2025. Questionnaires using google form were distributed to healthcare workers in a tertiary hospital in Southern Kedah. Respondents were given 10-20 minutes to complete the survey.

3.8 Sampling

A combination of stratified sampling and simple random sampling, both of which are probability sampling methods, was used to select 248 healthcare workers from a population of 684. The sample size was determined based on Krejcie and Morgan's (1970) table of sample size requirements.

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According to Tiwari and Tripathi (2024), probability sampling is a method used to select samples in a population in which each member has a known non-zero chance of being selected. This method is chosen to make sure that the samples used may represent the population. As a comparison, in a non-probability sampling method, although it might be more useful to use especially in studies requiring specific contexts, they are more prone to bias and are less representative of the population (Giri, 2024). Therefore, the combined stratified-random sampling approach was selected for this study to improve representativeness and minimise potential bias.

Probability sampling such as simple random sampling and stratified sampling is a reliable sampling method for obtaining a representative sample of the target

population. According to Rahman et al., (2022), the purpose of sampling is to choose a representative sample composed of a small number of samples or units drawn from a much larger population. Therefore, researchers may study a smaller group and make valid generalization to the population. However, despite being a reliable sampling method, Giri (2024) mentioned that this method may sometimes become impractical to use as it requires a complete list of all units of analysis which may not be available in certain cases.

In this study, a combination of simple random sampling and stratified sampling was used. Stratified sampling technique was first used to ensure appropriate grouping, followed by simple random sampling, which helped to ensure that each healthcare worker in the sampling frame had the same chance of being selected, while also ensuring fair representation across the key professional groups. Stratification was done by grouping the population into doctors, medical assistants, and nurses, followed by simple random selection within each group using a simple random sampling applet. This method helped minimise selection bias and enhance the generalisability of the study findings.

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3.8.1 Population

Population in this study is the healthcare workers working in a tertiary hospital in Southern Kedah. There are a total of 684 healthcare workers who are directly involved with patient care in the hospital and are involved in needle-related procedures including staff nurses, doctors and paramedics. Non-clinical staff such as housekeeping staff, radiographers, physiotherapists, occupational therapists or trainees are excluded in this study. Healthcare workers must be willing and have consented to participate in this study.

3.8.2 Sampling Frame

The sampling frame was derived from the hospital's database, obtained through the hospital's Human Resource Department. It comprised a complete list of all doctors, nurses and paramedics who are currently working in clinical departments within the hospital.

3.8.3 Unit of Analysis

Unit of analysis were the individual healthcare workers from a tertiary hospital in southern Kedah region.

3.8.4 Sample Size

There are approximately 684 healthcare workers in a tertiary hospital in Southern Kedah. This study uses Table of Sample Size by Krejcie and Morgan (1970) to determine the number of samples required in this study. Based on the table, the sample required in this study were 248 samples. However, a total of 250 samples were taken to ensure ease of data handling and account for incomplete responses.

Table 3.7
Table of Sample Size

Total number of population (N)	Total number of samples required (S)
10	10
20	19
30	28
40	36
50	44
100	80
150	108

Table 3.7 (Continued)

Total number of population (N)	Total number of samples required (S)
200	132
250	152
300	169
400	196
500	217
550	226
600	234
650	242
700	**248**
750	254
850	265
900	269
950	274
1000	278
1100	285
1200	291
1300	297
1400	302
1500	306
2000	322
3000	341

Source : Krejcie and Morgan, (1970).

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3.8.5 Sampling Procedure

Step 1: A name list of total healthcare workers was obtained from the Human Resource Department.

Step 2: The population was stratified into three professional groups: doctors, medical assistants, and nurses to ensure fair representation from each category.

Step 3: Within each professional group, every individual was assigned a unique number sequentially based on the namelist given by the Human Resource Department from 1 until *n (n*=total number of individuals in each group).

Step 3: Using a simple random sampling website (Simple Random Sampling Applet, University of Iowa), the random sample numbers were drawn for each professional group to select respondents.

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Step 4: Selected respondents were approached and were given an introduction regarding the purpose of the study. Respondents who had agreed to join the study were provided with a Google Form containing questionnaire items and instructions on how to answer the questionnaire.

3.9 Data Collection Procedures

Prior to collection of data, permission was obtained from the National Medical Research Register (NMRR) and the Director of Hospital Kulim, Kedah. Then, upon written approval from the Hospital Director, the questionnaire will be distributed. The questionnaire was given to the consented participants through an online platform using Google form. Google form questionnaire was used in this study due to its

efficiency, low cost, no interview bias, does not require prior arrangement and it maintains the anonymity of the respondents. The questionnaires were collected over a two-month period from May 2025 to June 2025. The respondents were assured that their responses were kept confidential in order to encourage participation.

3.10 Techniques of Data Analysis

Data analysis was performed using SPSS software. The analysis includes both descriptive and inferential statistics. Descriptive statistics (mean, standard deviation) were used to summarize the demographic characteristics and main variables. As for inferential statistics, Pearson correlation and multiple regression analysis were used to test the hypotheses and examine the relationships between knowledge, perception, attitude, and NSI prevention practice. Pearson correlation will test the strength and direction of the linear relationship between variables whereas multiple regression will be used to identify the relative contribution of each variable in explaining the variance in NSI prevention practice. The findings of this chapter are discussed systematically based on the objectives of the study.

3.10.1 Descriptive Analysis

Descriptive analysis was used to provide an overview of the respondent characteristics as well as the distribution of all main variables. This includes frequency, mean, percentage and standard deviation of the demographic data such as age, profession and gender.

3.10.2 Normality Analysis

Before conducting inferential analysis, the normality of data was assessed to ensure that the data obtained from the samples have normal distribution. According to

Demir (2022), normal distribution has two components, namely kurtosis and skewness. A variable is considered to follow a normal distribution if skewness and kurtosis falls within ±2.0, in line with the criteria suggested by George and Mallery (2010). If the data did not meet the normality distribution, alternative non-parametric methods such as PLS would be considered.

3.10.3 Reliability Analysis

Reliability of the instruments were tested using Cronbach alpha's coefficient. Each construct (knowledge, risk perception, attitude and NSI prevention practice) were analyzed to determine the internal consistency of the items. A Cronbach's Alpha value of 0.7 was considered acceptable (Nunally & Bernstein, 1994).

3.10.4 Correlation Analysis

Pearson correlation analysis was used to examine the relationship and its significance between main variables. This analysis helps to identify whether or not there is any relationship between variables as well as to identify the direction and strength of the relationship. The correlation coefficient was interpreted using Cohen's (1988) method which includes small correlation (r = 0.1 to 0.29), moderate correlation (r = 0.3 to 0.49) and strong correlation (r = 0.5 to 1.0).

3.10.5 Multiple Regression Analysis

Multiple regression analysis was used to determine the relative contribution and extent of significance to which knowledge, risk perception and attitude as independent variables affects NSI prevention practice amongst healthcare workers. The linearity tests, ANOVA, R value and P value of each variable were used to

interpret the strength and significance of the variables towards NSI prevention practice.

3.11 Summary of the Chapter

This chapter outlined the research methods used for investigating the influence of knowledge, perception and attitude towards the NSI prevention practice among healthcare workers. It covered the research framework, hypotheses development, research design, operational definitions, measurement of variables, data collection methods, sampling procedures, and data analysis techniques.

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CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter contains the results of this study starting with the demographic analysis of the respondents followed by the key findings of the study. All three research objectives were successfully accomplished as intended. First, to study the significant influence of knowledge towards needlestick injury (NSI) prevention practice amongst healthcare workers. Second, to investigate the significant influence of risk perception towards NSI prevention practice amongst healthcare workers. Third, to examine the significant influence of attitude towards NSI prevention practice amongst healthcare workers. Statistical Package for the Social Science (SPSS) version 23 were used to analyze the data. The results of this study are systematically reported in the respective tables. Finally, this chapter concludes with the conclusion of the study.

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4.2 Demography of Respondents

This section explains about demographic data of the respondents. There are five demographic information which are gender, race, age, occupation, and education level. These data are presented in a table form based on numbers and percentages of respondents as in Table 4.1.

Table 4.1

Descriptive Demographic Analysis

Demographic	Frequency (n=250)	Frequency Percentage (%)
Gender		
Male	46	18.4
Female	204	81.6
Race		
Malay	223	89.2
Chinese	4	1.6
Indian	21	8.4
Others	2	0.8
Respondent Age		
21 - 25 years	44	17.6
26 - 30 years	81	32.4
31 - 35 years	54	21.6
36 - 40 years	34	13.6
41 - 45 years	27	10.8
46 - 50 years	9	3.6
51 years and above	1	0.4
Occupation		
Doctor	69	27.6
Medical Assistant	22	8.8
Nurse	159	63.6
Education Level		
Diploma	171	68.4
Degree	76	30.4
Master or PhD	3	1.2

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4.2.1 Gender

Table 4.1 shows the gender of the respondents. From the total of 250 respondents (n = 250), 46 respondents are male, constituting 18.4% and 204 respondents are female, constituting 81.6%.

4.2.2 Race

The respondents' profile according to race showed that 89.2% (n = 223) are Malay. Followed by 8.4% (n = 21) are Indian, 1.6% (n = 4) are Chinese, and 0.8% (n = 2) are Others.

4.2.3 Age

The distribution of age showed that 17.6% respondent (n = 44) was aged 21 - 25 years, 32.4% respondent (n = 81) was aged 26 - 30 years, 21.6% respondent (n = 54) was aged 31 - 35 years, 13.6% respondent (n = 34) was aged 36 - 40 years, 10.8% respondent (n = 27) was aged 41 - 45 years, 3.6% respondent (n = 9) was aged 46 - 50 years, and lastly 0.4% respondent (n = 1) was aged 51 years above. This finding also shows that the mean and std.deviation of age of respondents are (M = 32.11, SD = 6.820).

4.2.4 Occupation

As for respondents' occupation, result showed that 69 of them (27.6%) are Doctors, 22 respondents (8.8%) are Medical Assistants and 159 respondents (63.6%) are Nurses.

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4.2.5 Education Level

According to the table 4.1, most of the educational level which is 68.4% (n = 171) were had Diploma, followed by 30.4% (n = 76) are Degree holder, and 1.2% (n = 3) are Master or PhD holder.

4.3 Reliability Analysis

As for the reliability result, the Cronbach Alpha values for knowledge, risk perception, attitude and practice on NSI prevention amongst healthcare workers are presented as in Table 4.2.

Table 4.2

Reliability Analysis

Variables	Cronbach's Alpha	N of items
NSI Prevention Practice	0.852	7
Knowledge	0.763	6
Risk perception	0.724	13
Attitude	0.706	5

The value of the Cronbach's alpha for dependent variable, which is NSI prevention practice is 0.852. Cronbach's Alpha for independent variables, which is knowledge, risk perception, and attitude are 0.763, 0.724, and 0.706 respectively. Therefore, based on the above table of Cronbach's Alpha, it can be concluded that all of the variables' value is more than 0.7 (>0.7). This indicates that the questions are acceptable with excellent reliability and suitable for further analysis.

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4.4 Normality Analysis

The result of the normalization of the data based on the Skewness and Kurtosis statistical tests are shown in Table 4.3.

Table 4.3

Normality Analysis

Variables	Skewness	Kurtosis
Practice	-1.565	1.400
Knowledge	-1.420	1.404
Risk perception	-1.153	.857
Attitude	-1.399	1.367

Based on the statistical analysis as shown in Table 4.7, the variables in the study are normally distributed with a mean test result of between ± 2 standard deviations (Hair et al. 1998). The value range of skewness from -1.565 to -1.153. Meanwhile the value of kurtosis is 0.857 to 1.404. From this result, it shows that the data are skewed and kurtosis, which is normal for knowledge, risk perception, attitude and practice on NSI prevention amongst healthcare workers. Therefore, the data in this study can be used for further analysis.

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4.5 Factor Analysis Results

Based on Table 4.4, the Kaiser-Meyer-Olkin (KMO) values range from 0.747 to 0.886. The value of KMO for NSI prevention practice is 0.886, for knowledge is 0.843, for risk perception is 0.747, and for attitude is 0.771. Variances explained are between 29.13% and 57.73%. Therefore, the values of KMO for all of the variables which are above 0.50, are acceptable. The Bartlett's Test of Sphericity (BtoS) values of all variables are also significant (p is less than 0.01). The following finding

confirms that the items used to measure NSI Prevention Practice, Knowledge, Risk Perception and Attitude are valid constructs, and the factor analysis assumptions are met, therefore making the questionnaire statistically sound.

Table 4.4

Results of Factor Analysis

Variables	No of item	KMO Value	Bartlett's Test of Sphericity	Eigen value	Variance explain	Sig. P
NSI Prevention Practice	7	.886	865.309	4.041	57.734	.000
Knowledge	6	.843	535.948	3.265	54.410	.000
Risk perception	13	.747	638.029	3.495	29.127	.000
Attitude	5	.771	243.204	2.431	48.617	.000

*** Kaiser-Meyer-Olkin Index ≥ 0.50 shows that the sampling is adequate for Factor Analysis.

*** Variance percentage shows the total variance percentage for the components with eigenvalues ≥ 1.0

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4.6 Descriptive Analysis

4.6.1 Descriptive Analysis of NSI Prevention Practice

In this research, the NSI prevention practice amongst healthcare workers are measured using seven (7) items. Table 4.5 indicates that all items had a very high score value. The item that obtained the highest score is 'I need to avoid breaking needles using hand.' (M = 4.82, SD = 0.422) and is followed by 'I need to practice regular use of sharp disposal containers after using needles.' (M = 4.81, SD = 0.440). Next, 'I need to practice regular use of gloves when handling needles.' (M = 4.79, SD = 0.419), 'I need to avoid needle recapping after use.' (M = 4.78, SD = 0.463), 'I have received Hepatitis B vaccination.' (M = 4.72, SD = 0.577), 'I need to practice regular use of tray to keep syringes.' (M = 4.63, SD = 0.621), and 'I am interested in receiving needle handling related training.' (M = 4.62, SD = 0.610). Overall, the score

of NSI prevention practice (M = 4.74, SD = 0.375) is at the very high level. The result of high mean values indicate that respondents strongly agree with statements related to the practice on NSI prevention.

Table 4.5

Descriptive Analysis of NSI Prevention Practice

No	Statements	VD	D	N	A	VA	Mean	SD
B1	I need to practice regular use of gloves when handling needles.	0 (0.0)	0 (0.0)	1 (0.4)	51 (20.4)	198 (79.2)	4.79	.419
B2	I need to practice regular use of tray to keep syringes.	0 (0.0)	3 (1.2)	10 (4.0)	63 (25.2)	174 (69.6)	4.63	.621
B3	I need to practice regular use of sharp disposal containers after using needles.	0 (0.0)	0 (0.0)	5 (2.0)	37 (14.8)	208 (83.2)	4.81	.440
B4	I am interested in receiving needle handling related training.	0 (0.0)	0 (0.0)	17 (6.8)	60 (24.0)	173 (69.2)	4.62	.610
B5	I need to avoid needle recapping after use.	0 (0.0)	0 (0.0)	5 (2.0)	46 (18.4)	199 (79.6)	4.78	.463
B6	I need to avoid breaking needles using hand.	0 (0.0)	0 (0.0)	4 (1.6)	36 (14.4)	210 (84.0)	4.82	.422
B7	I have received Hepatitis B vaccination.	1 (0.4)	1 (0.4)	7 (2.8)	50 (20.0)	191 (76.4)	4.72	.577
	Overall						**4.74**	**.375**

(Level: Very low = 1.00 – 1.80, Low = 1.81 – 2.60, Moderate = 2.61 – 3.40, High = 3.41 – 4.20, Very high = 4.21 - 5.00)

4.6.2 Descriptive Analysis of Knowledge

In this research, the knowledge amongst healthcare workers is measured by six (6) items. There is one negative item that was expressed in negative form (*) and it was recorded prior to analysis. Table 4.6 indicates that all items had a very high score value. The item with the highest score is 'I know how to use personal protective equipment (gloves) and standard working procedures in needle handling.' (M = 4.82, SD = 0.437) and is followed by 'I know how to use needles safely.' (M = 4.76, SD = 0.503). Next, 'I know what are the hazards associated with my job and the necessary precaution to be taken while using needle.' (M = 4.67, SD = 0.558), 'I know how to

reduce the risk of needle stick injury.' (M = 4.66, SD = 0.566), 'I know how to maintain or improve my workplace health and safety.' (M = 4.65, SD = 0.577), and *'I don't know what to do or whom to report if I notice any potential hazard of needle stick injury.' (M = 4.42, SD = 1.059). Overall, the score of knowledge (M = 4.66, SD = 0.439) is at the very high level.

Table 4.6

Descriptive Analysis of Knowledge

No	Statements	VD	D	N	A	VA	Mean	SD
C1	I know how to use needles safely.	0 (0.0)	0 (0.0)	9 (3.6)	41 (16.4)	200 (80.0)	4.76	.503
C2	I know how to use personal protective equipment (gloves) and standard working procedures in needle handling.	0 (0.0)	0 (0.0)	5 (2.0)	36 (14.4)	209 (83.6)	4.82	.437
C3	I know how to maintain or improve my workplace health and safety.	0 (0.0)	0 (0.0)	13 (5.2)	62 (24.8)	175 (70.0)	4.65	.577
C4	I know how to reduce the risk of needle stick injury.	0 (0.0)	1 (0.4)	9 (3.6)	63 (25.2)	177 (70.8)	4.66	.566
C5	I know what are the hazards associated with my job and the necessary precaution to be taken while using needle.	0 (0.0)	1 (0.4)	8 (3.2)	64 (25.6)	177 (70.8)	4.67	.558
*C 6	I dont know what to do or whom to report if I notice any potential hazard of needle stick injury.	170 (68.0)	49 (19.6)	10 (4.0)	9 (3.6)	12 (4.8)	4.42	1.059
	Overall						**4.66**	**.439**

* Negative Items

(Level: Very low = 1.00 – 1.80, Low = 1.81 – 2.60, Moderate = 2.61 – 3.40, High = 3.41 – 4.20, Very high = 4.21 - 5.00)

4.6.3 Descriptive Analysis of Risk Perception

In this research, the risk perception amongst healthcare workers is measured by thirteen (13) items. There are four negative items expressed in negative form (*) were recorded before analysis to give a true picture of risk perception. Table 4.7 indicates that eleven (11) items have the very high score while the other two (2) items have a high score value. The item that indicates the highest score is 'Health education for universal precaution on needlestick injuries to the health care workers can reduce the prevalence of needle stick injuries among them.' (M = 4.90, SD = 0.326) and is followed by 'Every health care worker should be immunized with Hepatitis B vaccine.' (M = 4.84, SD = 0.484). Next, 'The standard precautions to handle the sharp objects must always be followed as improper handling can lead to needlestick injury related infection.' (M = 4.83, SD = 0.464), 'Every health care workers has chance to get needle stick injury.' (M = 4.76, SD = 0.634), 'Unavailability of protective equipment can predispose a person to get needle stick injuries.' (M = 4.76, SD = 0.572), *'Handling needle without wearing glove is better than wearing glove.' (M = 4.72, SD = 0.778), 'Although there is a risk of infection, my confidence and working skill can help me to prevent needlestick injury.' (M = 4.70, SD = 0.624), *'Reporting needle stick injury is not much useful.' (M = 4.66, SD = 0.765), 'High workload can lead to needle stick injury.' (M = 4.65, SD = 0.774), *'I haven't learned about standard precaution for needle stick injury.' (M = 4.63, SD = 0.851), 'The infection transmitted from needle stick injuries are life threatening.' (M = 4.39, SD = 0.939), 'The health care workers should not resign from their profession if they get infected with HIV infection.' (M = 4.00, SD = 1.135, and 'Needle stick injuries is an unavoidable risk for health care workers.' (M = 3.69, SD = 1.411). Overall, the score of risk perception (M = 4.58, SD = 0.386) is at the very high level.

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Table 4.7

Descriptive Analysis of Risk Perception

No	Statements	VD	D	N	A	VA	Mean	SD
D1	Every health care workers has chance to get needle stick injury.	1 (0.4)	4 (1.6)	9 (3.6)	27 (10.8)	209 (83.6)	4.76	.634
D2	Needle stick injuries is an unavoidable risk for health care workers.	28 (11.2)	34 (13.6)	29 (11.6)	56 (22.4)	103 (41.2)	3.69	1.411
D3	High workload can lead to needle stick injury.	2 (0.8)	7 (2.8)	13 (5.2)	33 (13.2)	195 (78.0)	4.65	.774
D4	The health care workers should not resign from their profession if they get infected with HIV infection.	8 (3.2)	18 (7.2)	59 (23.6)	47 (18.8)	118 (47.2)	4.00	1.135
D5	The standard precautions to handle the sharp objects must always be followed as improper handling can lead to needlestick injury related infection.	0 (0.0)	1 (0.4)	6 (2.4)	28 (11.2)	215 (86.0)	4.83	.464
D6	The infection transmitted from needle stick injuries are life threatening.	6 (2.4)	8 (3.2)	20 (8.0)	65 (26.0)	151 (60.4)	4.39	.939
D7	Although there is a risk of infection, my confidence and working skill can help me to prevent needlestick injury.	0 (0.0)	5 (2.0)	7 (2.8)	47 (18.8)	191 (76.4)	4.70	.624
*D8	I havent learned about standard precaution for needle stick injury.	198 (79.2)	29 (11.6)	10 (4.0)	9 (3.6)	4 (1.6)	4.63	.851
D9	Unavailability of protective equipment can predispose a person to get needle stick injuries.	0 (0.0)	3 (1.2)	9 (3.6)	33 (13.2)	205 (82.0)	4.76	.572
*D10	Handling needle without wearing glove is better than wearing glove.	212 (84.8)	19 (7.6)	8 (3.2)	8 (3.2)	3 (1.2)	4.72	.778
*D11	Reporting needle stick injury is not much useful.	196 (78.4)	35 (14.0)	12 (4.8)	3 (1.2)	4 (1.6)	4.66	.765
D12	Every health care worker should be immunized with Hepatitis B vaccine.	1 (0.4)	0 (0.0)	6 (2.4)	25 (10.0)	218 (87.2)	4.84	.484
D13	Health education for universal precaution on needlestick injuries to the health care workers can reduce the prevalence of needle stick injuries among them.	0 (0.0)	0 (0.0)	2 (0.8)	21 (8.4)	227 (90.8)	4.90	.326
	Overall						**4.58**	**.386**

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* Negative Items

(Level: Very low = 1.00 – 1.80, Low = 1.81 – 2.60, Moderate = 2.61 – 3.40, High = 3.41 – 4.20, Very high = 4.21 - 5.00)

4.6.4 Descriptive Analysis of Attitude

In this research, the attitude amongst healthcare workers is measured by five (5) items. There are one negative items expressed in negative form (*) were recoded before analysis to give a true picture of attitude. Table 4.8 indicates that all items had a very high score value. The item that indicates the highest score is 'All needlestick injuries at work should be reported immediately.' (M = 4.86, SD = 0.401) and is followed by 'Sharp objects waste should be managed by a professional company instead of a common domestic waste company.' (M = 4.75, SD = 0.583). Next, 'In my opinion, needle stick injury is preventable.' (M = 4.70, SD = 0.541), 'I am worried about having needle stick injury.' (M = 4.63, SD = 0.677), and *'Patient care is more important than the safety of health care workers.' (M = 4.51, SD = 0.684). Overall, the score of attitude (M = 4.69, SD = 0.398) is at the very high level.

Table 4.8

Descriptive Analysis of Attitude

No	Statements	VD	D	N	A	VA	Mean	SD
E1	I am worried about having needle stick injury.	1 (0.4)	2 (0.8)	16 (6.4)	50 (20.0)	181 (72.4)	4.63	.677
*E2	Patient care is more important than the safety of health care workers.	153 (61.2)	72 (28.8)	24 (9.6)	1 (0.4)	0 (0.0)	4.51	.684
E3	All needlestick injuries at work should be reported immediately.	0 (0.0)	0 (0.0)	5 (2.0)	25 (10.0)	220 (88.0)	4.86	.401
E4	In my opinion, needle stick injury is preventable.	0 (0.0)	0 (0.0)	10 (4.0)	56 (22.4)	184 (73.6)	4.70	.541
E5	Sharp objects waste should be managed by a professional company instead of a common domestic waste company.	0 (0.0)	2 (0.8)	13 (5.2)	30 (12.0)	205 (82.0)	4.75	.583
	Overall						**4.69**	**.398**

* Negative Items

(Level: Very low = 1.00 – 1.80, Low = 1.81 – 2.60, Moderate = 2.61 – 3.40, High = 3.41 – 4.20, Very high = 4.21 - 5.00)

4.7 Correlation Analysis

Correlation analysis explains the relationship between the independent variable and dependent variables. It shows the direction, significance and strength of the variables of this study. The results of the Pearson Correlation are shown in Table 4.9.

Table 4.9

Pearson Correlation Coefficient Analysis

	Practice	**Knowledge**	**Risk perception**	**Attitude**
Practice	1	.462**	.479**	.476**
Knowledge	.462**	1	.575**	.498**
Risk perception	.479**	.575**	1	.618**
Attitude	.476**	.498**	.618**	1

** $p < 0.01$

Table 4.9 on Pearson Correlation Coefficient matrix shows that knowledge ($r = 0.462$, $p < 0.01$), risk perception ($r = 0.479$, $p < 0.01$), and attitude ($r = 0.476$, $p < 0.01$) all exhibits a moderately positive correlation with the NSI prevention practice amongst healthcare workers. These findings indicate that all of the independent variables are significantly associated with NSI prevention practice.

4.8 Multiple Regression

Multiple linear regression analysis was carried out with 3 factors as important predictive variables: knowledge, risk perception, and attitude. The results showed that

the prediction model for NSI prevention practice was significant [F(3, 246) = 37.624, $p < 0.05$], and R-square of this model was 0.315, which means that 31.5% of the variance of the NSI prevention practice can be explained by the independent variable of knowledge, risk perception and attitude, whereas the remaining is explained by other contributing factors.

Table 4.10

Coefficient Analysis for NSI Prevention Practice

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig. P**
		B	Std. Error	Beta		
1	(Constant)	1.890	.270		7.012	.000
	Knowledge	.194	.056	.228	3.443	.001
	Risk perception	.194	.071	.200	2.735	.007
	Attitude	.225	.065	.239	3.471	.001
a. Dependent Variable: NSI prevention practice						
R-square = 0.315, F(3, 246) = 37.624, Sig. F = 0.000						

Table 4.10 shows that the results of all proposed hypotheses are significant and accepted. Specifically, knowledge significantly influences the NSI prevention practice, ß = 0.228, t = 3.443, $p < 0.01$. Similarly, risk perception and attitude also significantly influence the NSI prevention practice, ß = 0.200, t = 2.735, $p < 0.01$ and ß = 0.239, t = 3.471, $p < 0.01$ respectively. Among the beta values, the attitude factor is the highest (0.239), which indicates it is the strongest factor that influences the NSI prevention practice amongst healthcare workers followed by knowledge factors (0.228), and risk perception factors (0.200).

Therefore, there a summary of hypothesis:

H1 Knowledge significantly influences the NSI prevention practice amongst healthcare workers.

Table 4.10 explains that knowledge is correlated and has a significant influence on the NSI prevention practice, $\beta = 0.228$, $t = 3.443$, $p < 0.01$. Therefore, H1 is accepted and it is validated that the relationship between knowledge and the NSI prevention practice amongst healthcare workers is positively significant.

H2 Risk perception significantly influences the NSI prevention practice amongst healthcare workers.

Table 4.10 explains that risk perception is correlated and has a significant influence on the NSI prevention practice, $\beta = 0.200$, $t = 2.735$, $p < 0.01$. Therefore, H2 is accepted and it is validated that the relationship between risk perception and the NSI prevention practice amongst healthcare workers is positively significant.

H3 Attitude significantly influences the NSI prevention practice amongst healthcare worker

Table 4.10 explains that attitude is correlated and has a significant influence on the NSI prevention practice, $\beta = 0.239$, $t = 3.471$, $p < 0.01$. Therefore, H3 is accepted and it is validated that the relationship between attitude and the NSI prevention practice amongst healthcare workers is positively significant.

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4.9 Conclusion

This chapter outlines the findings of the research data analysis in order to achieve the research objectives of this study. To conclude, the results of data analysis are clearly reported in each section. There are three hypotheses tested and all three (3) hypotheses are accepted in this study.

Table 4.11

Conclusion of Hypothesis

	Hypothesis	Result
H1	Knowledge significantly influences the NSI prevention practice amongst healthcare workers.	Accepted
H2	Risk perception significantly influences the NSI prevention practice amongst healthcare workers.	Accepted
H3	Attitude significantly influences the NSI prevention practice amongst healthcare workers.	Accepted

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CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter provides a comprehensive discussion of the study's findings and linking them with the research objectives. The chapter also describes the contribution that the study made to the available knowledge, discusses the study limitations, provides suggestions for the practical and theoretical recommendations in this study and also makes the conclusion. The purpose of this study was also to investigate how knowledge, risk perception and attitude affect the needlestick injury (NSI) prevention practice among healthcare workers using the conceptual framework of the Health Belief Model (HBM) in this study.

5.2 Discussion of findings

5.2.1 Significant Influence between Knowledge and NSI prevention practice

The result of this study had found a statistically significant influence between knowledge and NSI prevention practice. This is consistent with the Health Belief Model (HBM) which implies that knowledge contributes to the development of risk awareness and guides preventive behaviour. Knowledge provides a foundation for healthcare workers to understand the consequences of unsafe needle practices, highlighting the benefits of NSI prevention practices and guiding in taking steps required to prevent injuries.

The result of this study is in line with other several studies conducted such as Pandey et al. (2022) in which he had reported a moderate positive correlation between

knowledge and safe practice in his study while Al-Mugheed et al. (2023) had also noted that students with higher levels of knowledge regarding NSI experiences fewer injury incidents. Moreover, this concern was also raised by Wu et al. (2020) who stated that simulation-based training positively influences familiarity and adherence to safety protocols hence supporting the fact that knowledge can further improve practice when it is taught using effective methods. Similarly, Zhang et al. (2018) also added a comment that insufficient knowledge about NSI is one of the powerful predisposing factors in NSI cases.

Moreover, numerous studies have repeatedly shown that improved comprehension with systematic training and education can significantly reduce the occurrence of needlestick injuries. According to Zhang et al. (2018), he had reported that nursing students with inadequate training in occupational hazards and infection control had greater incidents of needlestick injuries. Similarly, Aljaloud et al. (2023) had also reported significant improvement in the level of knowledge regarding needlestick injuries among participants after participating in a two-week educational program,which in turn led towards the adoption of better preventive measures. In addition, Abubakar et al. (2021) also agrees that healthcare workers with better comprehension on needlestick injury prevention practices had lower occurrence of injuries while doing their clinical work. These findings support the result of this study where increased knowledge not only increased awareness but also improves safer work practices in the field.

In order to improve knowledge amongst healthcare workers towards needlestick injury (NSI) prevention, hospital administration as well as the Ministry of Health (MOH) needs to take appropriate steps such as to adopt proactive measures

and to improvise healthcare workers' knowledge base. A national-level action should be taken by the MOH which includes establishing and conducting standardized training protocols focusing on NSI prevention to ensure that NSI education becomes a mandatory element of both healthcare workers' induction as well as their continuing professional learning. In addition, MOH needs to dedicate specific funds towards training materials including making sure of the availability of modern, evidence-based resources across all healthcare facilities. Apart from these, nationwide campaigns should also be launched aiming towards motivating and establishing an effective safety culture across healthcare facilities.

At the institutional level, hospital management is responsible for implementing these guidelines and integrating them into daily clinical operations. This includes conducting regular and mandatory training sessions on safe needle handling. Hospital management should also provide refresher courses for senior staff to keep them up to date with the current knowledge. Hospitals should also introduce peer mentoring systems, where experienced staff can guide and supervise junior staff in adhering to safe practices. Moreover, in order to ensure persistent awareness, informative materials such as posters, infographics, and digital safety reminders should also be displayed in high-risk clinical areas. Apart from that, hospitals should also conduct routine audits and periodic knowledge assessments to monitor compliance and to identify preexisting gaps amongst their staff. Subsequently, incorporating NSI knowledge and adherence to safety behaviour as an element that is being monitored in the staff performance reviews and annual competency evaluations can further promote safety behaviour and reinforce the importance of safe practice. Hospital management should also collaborate with the occupational health unit to

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track and review NSI incidents so that they can also help to improvise educational strategies to reduce future risks.

Through setting a clear definition of such responsibilities, hospital administrations as well as the Ministry of Health can work in unity to ensure healthcare practitioners have adequate knowledge in needle stick injury prevention as well as maintaining a secure working place.

5.2.2 Significant Influence between Risk perception and NSI prevention practice

In this study, it is also found that risk perception has a significant and positive influence on NSI prevention practice. This finding aligns with HBM, particularly in the construct of perceived severity and perceived susceptibility. Healthcare workers who accurately perceive the likelihood and consequences of NSIs are more likely to take precautionary actions, therefore improving safety behaviour.

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The finding of this study is also in line with other several studies conducted. For instance, Obaoye (2021) had also reported a positive relationship between risk perception and safe practice. Obaoye (2021) had found that healthcare workers with heightened risk perception demonstrated greater adherence to safe practices. Similarly, Alinejad et al. (2023) had also observed that interventions enhancing risk perception improves safety compliance. Liu et al. (2021) also suggested that risk perception mediates the translation of knowledge into actual behavior.

However, some studies also suggested that despite agreeing on the importance of risk perception in shaping safety behaviour, the relationship is not always straightforward. For instance, Almloliky et al. (2024) reported a high NSI prevalence

although there is a high risk perception among nurses in Yemen and highlighted that institutional barriers and poor post-injury management attributes to the high NSI prevalence. Similarly, Erdachew (2023) also noted that risk perception alone did not predict safety behaviour unless it is supported by strong institutional support and a good safety climate.

To increase the perception of risk in needlestick injuries among healthcare workers, there is a need to ensure that the Ministry of Health (MOH) and the hospital administration to give priority to strategies that does not only increase knowledge, but also awareness, personal relevance and the comprehension of emotions in risks related to NSIs. At the national level, the MOH needs to incorporate the principles of behavioral psychology in the educational materials like personal experience, personal accounts of NSI occurrences, and case studies to maximize perceptual severity and susceptibility. Awareness campaigns can involve traditional posters or even via social media and internet-based tools that can involve brief video messages or interactive e-learning programs which can appeal to both the emotional and rational sides of the healthcare workers. Moreover, the MOH can also create a central reporting and feedback mechanism whereby NSI events reported in any facility will be compiled and shared as an educational tool to ensure maximum awareness at the national level.

At the institutional level, hospital management should focus on integrating risk perception into the work environment. This includes conducting department level safety reflection sessions, where staff discuss recent incidents or near-misses, and what risks were present or overlooked. Managers can also use risk perception self-assessment tools to help staff reflect on their own safety beliefs and attitudes. Implementing NSI risk dashboards in staff areas including displaying current

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statistics, reported cases, and reminders can further create ongoing awareness. In high-risk departments, rotating safety champions or peer observers could be appointed to provide real-time feedback when risky behaviours are observed. Finally, including emotional storytelling or impact-focused learning in staff meetings or induction can deepen personal engagement with the issue. These approaches aim not only to inform but to shift perception, so that NSI risks are consistently monitored and mitigated through preventive behaviour.

In conclusion, risk perception significantly influences NSI prevention practice and acts as one of the key determinants in safety behaviour. When healthcare workers are aware of their vulnerability to NSI and understand the consequence of such injuries, they are more likely to engage in precautionary actions and therefore promote safe practice. However, the effects of risk perception can be further enhanced when it is supported by institutional commitment, strong safety culture and consistent reinforcements.

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5.2.3 Significant Influence between Attitude and NSI prevention practice

Attitude emerged as the strongest predictor among all of the three independent variables. This suggests that healthcare workers with a positive attitude towards NSI prevention are significantly more likely to engage in safe needle-handling practices. This finding aligns with the Health Belief Model (HBM) in which perceived benefits and perceived barriers shape an individual's attitude towards safety behaviour. Healthcare workers who believe that adhering to NSI prevention practices will effectively reduce their risk (perceived benefit) and perceive minimal obstacles in

implementing these practices (perceived barriers) will develop a favorable attitude towards safety behaviour and therefore promote safe practices.

The finding of this study is similar to several other studies. Yazid et al. (2023), Timalsina and Anil (2022) and Alaridah et al. (2023) had all found a strong link between positive attitudes and adherence to safety protocols. Yazid et al. (2023) had found that nurses with positive attitudes had a higher tendency towards safe practices such as proper handwashing and incident reporting compliance. In another study, Timalsina and Anil (2022) also reported a positive relationship between attitude and NSI prevention practice among staff nurses in India. Similarly, Mohd Azman et al. (2020) also agreed that there is a positive correlation between healthcare workers' attitude and adherence to safety guidelines. In addition, Alaridah et al. (2023) had also found in her study that positive attitude promotes consistent use of personal protective equipment and compliance to incident reporting.

However, there are several studies that have shown that although attitude is an important component in safety behaviour, it does not operate alone. According to Al-Mugheed et al. (2023), he had found that positive attitudes amongst his respondents did not translate into safety behaviour, and this is mainly due to the institutional gaps and lack of enforcement. Similarly, Alsaabani et al. (2022) had also found that many workers with good attitudes still engage in unsafe practices such as needle recapping. According to Garus-Pakowska et al. (2019), knowledge enhances attitude by supplementing information that heightens fear and personal concern, which then promotes safer practice. This interaction suggests that combining attitude and other components may produce better outcomes and promote safety behaviour.

Within this study, it is observed that attitude plays an important role in NSI prevention practices among healthcare workers. A positive attitude, shaped by perceived benefits and minimal barriers significantly increases the likelihood of adopting safe behaviours. There are many ways to improve attitudes for healthcare workers. As an example, in order to promote favorable attitudes, the Ministry of Health (MOH) needs to encourage safety culture by developing attitude-based educational elements in the training syllabus, which may include emphasizing on responsibility, professional responsiveness, as well as to include about patient safety. In addition, it can also provide recognition to healthcare facilities with good safety cultures in the form of incentives or awards in order to send a message that the MOH is committed in encouraging safety culture, motivating adherence to safety procedures and creating a conducive environment for healthcare workers.

As for the hospital's operational level, it is important to focus on recognition and reinforcement methods for best NSI prevention practices by staff. These could include champions of safety recognitions, evaluational feedback markings, or others. Furthermore, hospitals must make attempts to ensure attitude-reflective elements in training sessions by incorporating staff role play and discussion opportunities which give them the chance to express their safe needle concerns and motivations. Department supervisors must personally motivate and actively encourage proper safety practices to build a collective responsibility culture. Allowing reporting of incidents and near-misses while protecting the reporters fosters a proactive attitude from the entire staff. There are many other attitude-building approaches that can be taken by the institution, but all of them aim at making staff regard needlestick safety

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with the seriousness it deserves and ensuring positive intentions are in everyday actions.

5.3 Contribution of the study

5.3.1 Theoretical contribution of the study

From a theoretical perspective, this study applies the Health Belief Model as the main underpinning theory to develop its framework in predicting factors influencing safety behaviour regarding NSI. The findings of this study affirms the applicability of HBM and supports the relevance of all key HBM constructs in shaping healthcare workers' preventive behaviour.

The strong influence of attitude as observed in this study aligns with the HBM's assumption that individuals are more prone towards safety behaviour when they believe that the consequences are severe and the benefits outweigh the perceived barriers. Moreover, risk perception, developed from perceived susceptibility and perceived severity, plays its role as a strong internal motivator for healthcare workers to adopt safety practices to reduce the likelihood of needlestick injuries. In addition, the findings of this study also highlights that knowledge plays an important supporting role in enhancing awareness, shaping perception and fostering a more favorable attitude towards safety.

Overall, this study reinforces the theoretical strength of HBM in explaining health related behavioural outcomes within an occupational safety context and extends the practicability of HBM beyond public health settings. This study also affirms the validity of the pre-existing body of knowledge and provides a solid

foundation for future research and intervention models aiming at improving needle-related safety behaviour amongst healthcare workers.

5.3.2 Practical contribution of the study

In terms of practical contribution, the findings of this study highlights the most significant factor that influences NSI prevention practices along with the supporting factors. This finding will be a useful insight for health administrators, safety practitioners and policy makers in creating a more comprehensive policy aimed at improving NSI prevention practices amongst healthcare workers in Malaysia. Training programs, education syllabus and awareness campaigns can be effectively developed by addressing the core factors affecting safety behaviour as well as enhancing motivation and reducing barriers to safe practices.

This study also shows the level of knowledge, risk perception and attitude among healthcare workers, offering a clearer picture on the current safety landscape within MOH hospitals. This can help hospital administrators to identify specific areas for improvement and develop a more efficient refresher training, practical workshops or safety enforcement. By understanding the behavioural tendencies such as level of knowledge, general risk perception and attitude, hospital administrators can develop evidence-based interventions and strategies to tailor for the needs and barriers faced by healthcare workers in the field.

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5.4 Limitation of the study

While this study offers valuable insight on factors influencing NSI prevention practices, there are certain limitations that must be recognized. This study uses a cross-sectional design, which may make it difficult to find causal links between

knowledge, risk perception, attitude and NSI prevention practices. The respondents were observed at one single point of time and may not be able to capture behavioural trends over time.

Secondly, this study relied on self-reported data by the respondents which may cause bias. Respondents may have overstated or underestimated their compliance to safety practices, knowledge, risk perception or attitude. Such discrepancies may be due to the sensitive nature of the topic, social desirability bias or limitations in personal recall.

Thirdly, this study was conducted in a single government subsidized hospital in Kedah. Therefore, it may not represent the general healthcare worker population in Malaysia especially in private hospitals whereby the environment, resources and facility may be different from a public hospital.

Next, this study was focused on individuals' knowledge, risk perception, attitude and practice. This study did not account for external or environmental factors such as administrative support, workload, access to safety devices and others. Therefore, the findings of this study are only based on individual factors and may not provide a comprehensive view of the broader factors that may significantly impact NSI prevention practices.

5.5 Recommendation for the Future Research

This study is a cross-sectional design study and therefore, might not be able to study deeper on the causal factors. It is recommended for future researchers to apply

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other designs such as the longitudinal study so that a more thorough analysis of the factors influencing NSI prevention practice and causal factors can be identified.

Secondly, participants of this study are limited to one hospital in Kedah. Future research should cover a more diverse population from a wide range of demographics from various institutions and regions of Malaysia. This would allow for the wider generalizability of the research outcomes across healthcare professionals from across the country. Employing such a strategy would not only enhance the validity of the present study but also encourage a better understanding of practices for the prevention of needle stick injuries from a national perspective.

Next, it is recommended that further research should include the possible involvement of environmental and organizational factors such as work stress, workload, availability of safety equipment, adequate staffing, administrative support, safety culture and other relevant factors that may also influence NSI occurrence. This will help to provide a more comprehensive understanding on the factors influencing NSI prevention practice amongst healthcare workers in Malaysia.

Finally, it is also suggested that future research should consider being done using a mixed method. Healthcare workers are human beings, therefore the factors that may affect their compliance and adherence to NSI prevention practices may be complex as it mainly involves human factors. By implementing both quantitative and qualitative methods, future researchers may be able to find a deeper and more comprehensive understanding on the significant factors that may affect NSI occurrences amongst healthcare workers.

5.6 Conclusion

This study was performed to investigate the significant influence of knowledge, risk perception and attitude towards NSI prevention practice amongst healthcare workers. This study relies on the Human Belief Model as its underpinning theory in understanding and discovering factors which may affect safety behaviour amongst its respondents. Based on the study findings, it is found that knowledge, risk perception and attitude has significant influence over NSI prevention practice among the respondents, with attitude being its most prominent predictor. This indicates that healthcare workers which possess sufficient knowledge regarding NSI, good risk perception and positive attitude towards NSI prevention are more likely to engage in safety behaviour and adopt NSI prevention practices while performing needle-related procedures.

Based on such findings, the present study provides useful information to the hospital management, safety practitioners, and the Ministry of Health to formulate specific measures to reduce the occurrence of NSI among healthcare professionals. This factor of attitude as the greatest predictor creates the need of constant behavioural-based training activities, awareness and supportive policies by the institutions to create a safety climate at workplace. Hospital administrators should focus on implementing frequent training programs with the purpose of improving knowledge and the overall aim of shaping positive attitudes and better perception towards NSI prevention. The study findings can also be used by safety practitioners in designing more effective interventions that are not based on technical or procedural compliance but are instead aimed at encouraging behaviour change. Also, this evidence can be used by the Ministry of Health to strengthen national guidelines,

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enforce standard training modules, and invest in holistic NSI prevention systems that consider both cognitive and psychosocial factors, which affect safety behaviour in healthcare facilities.

Despite several limitations, this study is expected to contribute to the body of knowledge by highlighting the importance of addressing knowledge deficits, improving risk perception and fostering a safe attitude to encourage compliance in NSI prevention practice amongst healthcare workers. It is hoped that insights gained from this study may be able to assist relevant parties to develop comprehensive policies and effective intervention methods to address this issue.

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1. APPENDIX

Appendix A - Permohonan Kebenaran Pengarah Hospital

Dr. Muhammad Fadhil bin Shamsudin
(Mahasiswa Sarjana Sains Pengurusan Keselamatan dan Kesihatan Pekerjaan)
Pegawai Perubatan UD 13
Unit Perubatan Forensik
Hospital Kulim
Lebuh Hi-Tech
09010 Kulim

DITERIMA
09 JUN 2025
PENGARAH HOSPITAL KULIM

Dr Mohd Ruhaifi bin Ali
Pengarah
Hospital Kulim
Lebuh Hi-Tech
09010 Kulim

6 JUN 2025

Ybrs. Dr,

PERMOHONAN KEBENARAN UNTUK MENJALANKAN AKTIVITI KAJIAN DI HOSPITAL KULIM.

Dengan segala hormatnya saya merujuk kepada perkara di atas.

2. Untuk makluman pihak Dr., saya sedang mengikuti pengajian bagi program Sarjana Sains Pengurusan Keselamatan Dan Kesihatan Pekerjaan (Msc. OSHM) di Universiti Utara Malaysia (UUM), Sintok.

3. Saya ingin memohon kebenaran untuk menjalankan aktiviti kajian yang bertajuk 'Influence of Knowledge, Risk Perception and Attitude towards NSI Prevention Practices Among Healthcare Workers'. Kajian ini adalah merupakan salah satu syarat LULUS bagi program pengajian ini.

4. Aktiviti kajian yang akan dijalankan adalah berupa survei menggunakan set soalan yang telah disediakan kepada anggota kesihatan daripada golongan pegawai perubatan, penolong pegawai perubatan dan jururawat. Bersama surat ini, saya lampirkan juga dokumen-dokumen berkaitan dengan kajian tersebut:

i. Proposal penyelidikan
ii. Borang IAHODIA

5. Saya amat berharap agar pihak Dr. dapat mempertimbangkan permohonan saya. Segala pertimbangan dan perhatian yang diberikan oleh pihak Dr. Saya dahului dengan ucapan terima kasih.

Sekian, terima kasih.

Saya yang menjalankan amanah,

(MUHAMMAD FADHIL BIN SHAMSUDIN)

DR. MOHD RUHAIFI BIN ALI
No. Pend. Penuh MPM : 46586
Pengarah
Hospital Kulim, Kedah

9/6/2025

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Appendix B - Maklumbalas Kebenaran Pengarah Hospital

MAKLUMBALAS PERMOHONAN KEBENARAN MENJALANKAN AKTIVITI KAJIAN DI HOSPITAL KULIM

Tajuk Kajian :

Influence of Knowledge, Risk Perception and Attitude Towards Needlestick Injury Prevention Practice Amongst Healthcare Workers.

Nama Penyelidik :

Muhammad Fadhil bin Shamsudin
Mahasiswa Pascasarjana
Program Pengajian Sains Pengurusan Keselamatan Dan Kesihatan Pekerjaan (Msc. OSHM)
Universiti Utara Malaysia
06010 Sintok
Kedah Darul Aman

Pihak pengurusan hospital dengan ini membuat keputusan seperti berikut :

☑ Membenarkan aktiviti kajian berkenaan dijalankan di fasiliti Hospital Kulim.

☐ Tidak membenarkan kajian tersebut dijalankan.

_____

_____

_____

_____

Sekian, Terima kasih.

.....

DR.MOHD RUHAIFI BIN ALI
No.Pend.Penuh MPM:46586
PENGARAH
Hospital Kulim,Kedah

Universiti Utara Malaysia

Appendix C - Borang IAHODIA

Ver 3.0 September 2014

NMRR/FORM/IAHODIA

INVESTIGATOR'S AGREEMENT, HEAD OF DEPARTMENT AND ORGANISATIONAL / INSTITUTIONAL APPROVAL

This document is intended for online submission for formal research registration. It is issued as the Investigator's Agreement to participate in the research as well as the investigator's **Head of Department and Director's Approval**. Please upload this document in the required section in NMRR upon completion.
**Note: This form is NOT to be used for obtaining permission to conduct the research at the named / selected study site(s).

*Dokumen ini adalah untuk penghantaran 'online' mengikut prosedur rasmi pendaftaran penyelidikan. Borang ini dikeluarkan sebagai pengakuan penyelidik untuk menjalankan penyelidikan dan persetujuan serta kebenaran daripada **Ketua Jabatan dan Pengarah masing-masing**. Sila lengkapkan borang ini dan memuat naik ke dalam sistem NMRR di seksyen yang telah ditetapkan.*
***Nota : Borang ini BUKAN digunakan untuk tujuan mendapatkan kelzinan untuk menjalankan penyelidikan di lokasi kajian yang dipilih.*

Research Title *[Tajuk Penyelidikan]*	Influence of Knowledge, Risk Perception and Attitude towards Needlestick Injury Prevention Practice Amongst Healthcare Workers.		
Research ID *[Nombor Pendaftaran]*	RSCH ID-25-03905-HO9	**Protocol Number (if available)** *[Nombor Protokol (jika ada)]*	

INVESTIGATOR'S AGREEMENT *[PERSETUJUAN PENYELIDIK]*

I have understood the above mentioned proposed research and I agree to participate as an investigator and being responsible to conduct the research.

Saya faham atas cadangan penyelidikan di atas dan bersetuju untuk mengambil bahagian serta bertanggungjawab untuk melaksanakan penyelidikan tersebut.

Name *[Nama]*	Muhammad Fadhil bin Shamsudin
IC number *[Nombor K/P]*	871130-14-5683
Institute *[Institusi]*	Hospital Kulim
Signature and Official stamp *[Tandatangan dan Cop Rasmi]*	Dr Muhammad Fadhil B. Shamsudin No MMC : 64594 Pegawai Perubatan UD52 Unit Perubatan Forensik Hospital Kulim
Date *[Tarikh]* 4/6/2025	

HEAD OF DEPARTMENT AGREEMENT *[PERSETUJUAN KETUA JABATAN]*

I agree to allow the above named investigator to conduct the above titled research.

Saya bersetuju dan membenarkan pegawai seperti bernama di atas untuk menjadi penyelidik di dalam projek penyelidikan tersebut di atas.

Name of Head : *[Nama Ketua Jabatan]*	MOHD HAZWAN HUSAIN BIN MUUTI
Signature and Official stamp *[Tandatangan dan Cop Rasmi]*	DR MOHD HAZWAN HUSAIN B. MUUTI PEGAWAI PERUBATAN UD52 UNIT PERUBATAN FORENSIK HOSPITAL KULIM
Date *[Tarikh]* 04/06/2025	

ORGANISATIONAL / INSTITUTIONAL APPROVAL *[KEBENARAN ORGANISASI / INSTITUSI]*

I acknowledge and approve the named officer to conduct the above titled research.

Saya mengesahkan dan mengambil maklum penglibatan pegawai ini di dalam penyelidikan tersebut.

Name of Director *[Nama Pengarah]*	
Signature and Official stamp *[Tandatangan dan Cop Rasmi]*	DR.MOHD RUHAIFI BIN ALI No.Pend.Penuh MPM:46586 PENGARAH Hospital Kulim,Kedah
Date *[Tarikh]* 09 JUN 2025	

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Appendix D - Participant Information Sheet

Version 2, dated 9/7/2025

PARTICIPANT INFORMATION SHEET / *LEMBARAN MAKLUMAT PESERTA*

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1. Title of Study/*Tajuk Kajian***:**

INFLUENCE OF KNOWLEDGE, RISK PERCEPTION AND ATTITUDE TOWARDS NEEDLESTICK INJURY PREVENTION PRACTICE AMONGST HEALTHCARE WORKERS

PENGARUH PENGETAHUAN, PERSEPSI RISIKO DAN SIKAP TERHADAP AMALAN PENCEGAHAN CEDERA AKIBAT TUSUKAN JARUM SUNTIKAN DALAM KALANGAN PEKERJA KESIHATAN

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2. Name of Investigator and Institution/*Nama Penyelidik dan Institusi***:**

Dr. Muhammad Fadhil bin Shamsudin
Universiti Utara Malaysia

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3. Name of Sponsor/*Penaja Kajian* **:**

No sponsor or external funding

Tiada penaja atau pembiayaan luar

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4. Introduction/*Pengenalan***:**

It is important that you understand why this research is being done and what it will involve. Please take your time to read this information carefully before deciding whether to participate. Feel free to ask the study team any questions. If you are satisfied and willing to participate, you may continue to complete the online questionnaire.

Participation is completely **voluntary**. You may withdraw at any time. Any information collected up to your withdrawal will not be used. Your participation or refusal will not affect your job, benefits, or entitlements. This study has been approved by the Medical Research and Ethics Committee, Ministry of Health Malaysia.

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Adalah penting untuk anda memahami sebab kajian ini dijalankan dan apa yang akan terlibat. Sila luangkan masa untuk membaca maklumat ini dengan teliti sebelum membuat keputusan tentang penyertaan. Anda bebas bertanya kepada pasukan kajian jika terdapat sebarang soalan. Jika anda berpuas hati dan bersedia untuk ikut serta, anda boleh meneruskan untuk mengisi borang soal selidik dalam talian.

Penyertaan adalah sepenuhnya sukarela. Anda boleh menarik diri pada bila-bila masa. Sebarang maklumat yang dikumpulkan sebelum anda menarik diri tidak akan digunakan. Penyertaan atau penolakan anda tidak akan menjejaskan pekerjaan, faedah, atau hak anda. Kajian ini telah diluluskan oleh Jawatankuasa Etika dan Penyelidikan Perubatan, Kementerian Kesihatan Malaysia.

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5. What is the purpose of the study/*Apakah tujuan kajian ini***?**

This study aims to explore how healthcare workers' knowledge, risk perception, and attitudes influence their practices in preventing needlestick injuries (NSIs). The results will help improve occupational safety practices. The study will run for 1 month and aims to include approximately 250 participants.

Kajian ini bertujuan untuk meneroka bagaimana pengetahuan, persepsi risiko dan sikap pekerja kesihatan mempengaruhi amalan mereka dalam mencegah kecederaan akibat tusukan jarum suntikan (NSI). Hasil kajian ini akan membantu dalam memperbaiki amalan keselamatan pekerjaan. Kajian ini akan dijalankan selama 1 bulan dan menyasarkan sekitar 250 orang peserta.

---

6. What are my responsibilities when taking part in this study/*Apakah tanggungjawab saya jika menyertai kajian ini***?**

You will be asked to complete an online questionnaire which will take about 10–15 minutes. The questionnaire contains 5 sections on demographic details, knowledge, risk perception, attitude, and practice related to NSI prevention.

Anda akan diminta untuk melengkapkan satu soal selidik secara dalam talian yang mengambil masa lebih kurang 10–15 minit. Soal selidik ini mengandungi 5 bahagian berkaitan maklumat demografi, pengetahuan, persepsi risiko, sikap dan amalan berkaitan pencegahan NSI.

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7. What are the potential risks and side effects of being in this study/*Apakah risiko atau kesan sampingan dari menyertai kajian ini***?**

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There are no direct physical risks. The only minimal risk is discomfort from answering certain questions. You may skip any question you are not comfortable answering.

Tiada risiko fizikal secara langsung. Satu-satunya risiko minimum adalah ketidakselesaan menjawab soalan tertentu. Anda boleh memilih untuk tidak menjawab sebarang soalan yang membuat anda tidak selesa.

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8. What are the benefits of being in this study/*Apakah kebaikan menyertai kajian ini?*

The results of this study may help to highlight important factors influencing safety behaviour and NSI prevention practices so that we can improve NSI prevention strategies and policies that enhance safety for healthcare workers like you.

No monetary payment or other form of compensation will be provided to participants for their involvement in this study. Participation is entirely voluntary and undertaken without any financial incentive.

Hasil kajian ini mungkin dapat mengetengahkan faktor-faktor penting yang mempengaruhi tingkah laku keselamatan dan amalan pencegahan NSI supaya strategi dan polisi pencegahan NSI dapat ditambah baik demi keselamatan pekerja kesihatan seperti anda.

Tiada bayaran atau ganjaran akan diberikan kepada peserta kajian ini. Penyertaan adalah secara sukarela tanpa sebarang insentif kewangan

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9. Who may access this study data/*Siapa yang boleh mengakses data kajian ini*?

Individuals involved in this study, qualified monitors and auditors, governmental or regulatory authorities may inspect the study data, where appropriate and necessary.

Pihak yang terlibat dalam kajian ini, pemantau atau juruaudit yang berkelayakan, pihak berkuasa kerajaan atau pengawalseliaan boleh memeriksa data kajian ini jika diperlukan.

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9. Who is funding the research/*Siapa yang membiayai kajian ini***?**

This study does not receive any external funding. It is conducted as part of a Master's degree requirement.

Kajian ini tidak dibiayai oleh mana-mana pihak luar. Ia dijalankan sebagai sebahagian daripada keperluan pengajian Ijazah Sarjana.

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10. Will my information be kept private/*Adakah informasi saya dirahsiakan***?**

Yes. All data will be anonymous and kept strictly confidential. Only the study team and relevant ethics authorities will have access to the data. No personal identifiers will be recorded. Your identity will not appear in any publication or report.

Ya. Semua data akan dirahsiakan dan dikendalikan secara sulit. Hanya pasukan kajian dan pihak berkuasa etika berkaitan sahaja yang mempunyai akses kepada data ini. Tiada maklumat peribadi akan direkodkan. Identiti anda tidak akan didedahkan dalam mana-mana penerbitan atau laporan.

---

11. Who should I contact if I have questions/*Siapa yang boleh saya hubungi jika saya ada pertanyaan***?**

Dr. Muhammad Fadhil bin Shamsudin
Email: fadhil2020@yahoo.com
Phone: 012-4960241

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For concerns about your rights as a participant/*Untuk sebarang kebimbangan berkenaan hak anda sebagai peserta kajian*:
Secretary, Medical Research & Ethics Committee, Ministry of Health Malaysia
Phone: 03-3362 8407 / 8205 / 8888

Appendix E - Informed Consent Form

Version 2, dated 9/7/2025

INFORMED CONSENT FORM

Title of Study:

INFLUENCE OF KNOWLEDGE, RISK PERCEPTION AND ATTITUDE TOWARDS NEEDLESTICK INJURY PREVENTION PRACTICE AMONGST HEALTHCARE WORKERS

It is important that you understand the purpose of this research and what your participation will involve before you decide to take part. Please read the following information carefully. If anything is unclear, you may contact the researcher for further clarification.

You are allowed to take your time to read the Participant Information Sheet and Informed Consent Form to consider participating in this study. No personal information such as name, contact number or email address will be taken throughout the survey process. All responses will be kept confidential.

Your participation is entirely **voluntary**, and you may choose not to participate or to withdraw at any time without any consequences. If you decide to withdraw from the study at any point before submitting the questionnaire, you may simply exit the Google Form or close the browser. No measures will be taken to preserve any partially completed responses, and any data entered up to that point will **not be saved or recorded**. Only fully submitted questionnaires will be included in the analysis.

By signing below, I confirm the following:

- I have read and understood the Participant Information Sheet.
- I have had the opportunity to ask questions, and all were answered satisfactorily.
- I understand that my participation is voluntary and I may withdraw at any time.
- I understand the risks and benefits of participating in this study.
- I give my consent to participate under the conditions stated.
- I understand my data will be kept confidential and securely stored.
- I understand that this study uses an **implied consent** process. By clicking the "I Agree" button and submitting the completed questionnaire, I voluntarily agree to participate in this study. I acknowledge that no written consent will be obtained, and my consent is implied through my action of proceeding with the questionnaire.

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I hereby agree to participate in this research study entitled ***"INFLUENCE OF KNOWLEDGE, RISK PERCEPTION AND ATTITUDE TOWARDS NEEDLESTICK INJURY PREVENTION PRACTICE AMONGST HEALTHCARE WORKERS"***.

I have read and understood the Participant Information Sheet, including the purpose of the study, procedures involved, potential risks and benefits, and my rights as a participant. I understand that my participation is voluntary, and I may withdraw at any time without any consequences. I also understand that no personal identifying information will be collected and that all responses will be kept strictly confidential.

By completing and submitting the questionnaire, I hereby give my **consent** to participate in this study.

☐ I Agree

☐ I Disagree

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Appendix F - Questionnaire Form

Influence of Knowledge, Risk Perception and Attitude towards Needlestick Injury Prevention Practice Amongst Healthcare Workers

Google Form Link : https://forms.gle/vCxVgfVnJwoEfAsU6

Questionnaire Instruction:
Please provide the exact answer to every question. The feedback given will be kept anonymous and only used for academic purposes.

Section A: DEMOGRAPHIC INFORMATION

1. Gender

   ( ) Male

   ( ) Female

2. Race

   ( ) Malay

   ( ) Chinese

   ( ) Indian

   ( ) Others

3. Age : .....

4. Occupation

   ( ) Doctor

   ( ) Medical Assistant

   ( ) Nurse

5. Education Level

   ( ) Diploma

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( ) Degree

( ) Master or PhD

Section B: PRACTICE ON NEEDLESTICK INJURY PREVENTION

This part is to assess the application of safe practice while doing needle-related procedures amongst healthcare workers.

For every item, please choose your opinion based on the scale:

1	2	3	4	5
Very Disagree	**Disagree**	**Neutral**	**Agree**	**Very Agree**

1	I need to practice regular use of gloves when handling needles. *Saya perlu sentiasa mengamalkan pemakaian sarung tangan ketika mengendalikan jarum suntikan.*	**1**	**2**	**3**	**4**	**5**
2	I need to practice regular use of tray to keep syringes. *Saya perlu sentiasa menggunakan tray sebagai tempat letak picagari.*	**1**	**2**	**3**	**4**	**5**
3	I need to practice regular use of sharp disposal containers after using needles. *Saya perlu menggunakan bekas pelupusan sisa objek tajam untuk membuang jarum setelah digunakan.*	**1**	**2**	**3**	**4**	**5**
4	I am interested in receiving needle handling related training. *Saya berminat untuk menyertai latihan berkaitan pengurusan jarum yang telah digunakan.*	**1**	**2**	**3**	**4**	**5**
5	I need to avoid needle recapping after use. *Saya perlu elakkan amalan menutup semula jarum suntikan selepas digunakan.*	**1**	**2**	**3**	**4**	**5**
6	I need to avoid breaking needles using hand. *Saya perlu elakkan amalan mematahkan jarum suntikan menggunakan tangan.*	**1**	**2**	**3**	**4**	**5**

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7	I have received Hepatitis B vaccination. *Saya telah menerima suntikan vaksin Hepatitis B.*	1	2	3	4	5

Section C: KNOWLEDGE

This part is to assess healthcare workers' level of knowledge regarding needlestick injury (NSI) and universal precaution (UA).

For every item, please choose your opinion based on the scale:

1	2	3	4	5
Very Disagree	**Disagree**	**Neutral**	**Agree**	**Very Agree**

1	I know how to use needles safely. *Saya tahu bagaimana untuk melaksanakan tugas saya menggunakan jarum dengan selamat.*	1	2	3	4	5
2	I know how to use personal protective equipment (gloves) and standard working procedures in needle handling. *Saya tahu cara menggunakan peralatan pelindung diri (sarung tangan) dan prosedur kerja standard berkenaan pengurusan jarum.*	1	2	3	4	5
3	I know how to maintain or improve my workplace health and safety. *Saya tahu cara mengekalkan atau meningkatkan kesihatan dan keselamatan di tempat kerja saya.*	1	2	3	4	5
4	I know how to reduce the risk of needle stick injury. *Saya tahu bagaimana cara untuk mengurangkan risiko kecederaan tusukan jarum suntikan.*	1	2	3	4	5
5	I know what are the hazards associated with my job and the necessary precaution to be taken while using needle. *Saya tahu apakah bahaya yang berkaitan dengan pekerjaan saya dan langkah berjaga-jaga yang perlu diambil semasa bekerja menggunakan jarum.*	1	2	3	4	5
6	I **don't know** what to do or whom to report if I notice any potential hazard of needle stick injury.	1	2	3	4	5

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	*Saya **tidak tahu** apa yang perlu dilakukan atau kepada siapa yang perlu saya laporkan jika saya melihat sebarang potensi bahaya tusukan jarum suntikan di tempat kerja saya.*					

Section D: RISK PERCEPTION

This part is to assess the level of risk perception among healthcare workers regarding needlestick injury (NSI).

For every item, please choose your opinion based on the scale:

1	2	3	4	5
Very Disagree	**Disagree**	**Neutral**	**Agree**	**Very Agree**

1	Every health care workers has chance to get needle stick injury. *Semua kakitangan kesihatan terdedah kepada risiko kecederaan tusukan jarum suntikan.*	**1**	**2**	**3**	**4**	**5**
2	*Needle stick injuries is an **unavoidable risk** for health care workers.* *Kecederaan tusukan jarum suntikan adalah satu **risiko yang tidak dapat dielakkan** di kalangan kakitangan kesihatan.*	**1**	**2**	**3**	**4**	**5**
3	High workload can lead to needle stick injury. *Beban kerja yang tinggi boleh menyebabkan kecederaan tusukan jarum.*	**1**	**2**	**3**	**4**	**5**
4	The health care workers **should not** resign from their profession if they get infected with HIV infection. *Kakitangan kesihatan **tidak seharusnya** meletakkan jawatan daripada profesion mereka jika mereka dijangkiti jangkitan HIV.*	**1**	**2**	**3**	**4**	**5**
5	*The standard precautions to handle the sharp objects must always be followed as **improper handling** can lead to needlestick injury related infection.* *Langkah berjaga-jaga sewaktu mengendalikan objek tajam mesti sentiasa dipatuhi kerana*	**1**	**2**	**3**	**4**	**5**

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	pengendalian yang tidak betul *boleh menyebabkan penularan penyakit akibat kecederaan tusukan jarum suntikan.*					

6	The infection transmitted from needle stick injuries are life threatening. *Jangkitan yang ditularkan daripada kecederaan tusukan jarum suntikan boleh mengancam nyawa.*	**1**	**2**	**3**	**4**	**5**
7	Although there is a risk of infection, my confidence and working skill can help me to prevent needlestick injury. *Walaupun terdapat risiko jangkitan, keyakinan dan kemahiran saya boleh membantu mengelakkan terjadinya kecederaan tusukan jarum suntikan.*	**1**	**2**	**3**	**4**	**5**
8	I **haven't** learned about standard precaution for needle stick injury. *Saya **belum pernah belajar** tentang piawaian langkah berjaga-jaga (standard precaution) untuk mengelakkan kecederaan tusukan jarum suntikan.*	**1**	**2**	**3**	**4**	**5**
9	Unavailability of protective equipment can predispose a person to get needle stick injuries. *Ketiadaan peralatan perlindungan diri boleh menyebabkan seseorang terdedah kepada kecederaan akibat tusukan jarum suntikan.*	**1**	**2**	**3**	**4**	**5**
10	Handling needle **without** wearing glove is **better** than wearing glove. *Mengendalikan jarum **tanpa** menggunakan sarung tangan adalah **lebih baik** berbanding dengan menggunakan sarung tangan.*	**1**	**2**	**3**	**4**	**5**
11	Reporting needle stick injury is **not much** useful. *Melaporkan kecederaan tusukan jarum suntikan adalah **tidak begitu** bermanfaat.*	**1**	**2**	**3**	**4**	**5**
12	Every health care worker should be immunized with Hepatitis B vaccine.	**1**	**2**	**3**	**4**	**5**

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	Semua kakitangan kesihatan perlu diimunisasikan dengan vaksin Hepatitis B.					

13	Health education for universal precaution on needlestick injuries to the health care workers **can reduce** the prevalence of needle stick injuries among them. *Pendidikan kesihatan tentang pematuhan universal berkenaan pencegahan kecederaan tusukan jarum suntikan kepada kakitangan kesihatan **boleh mengurangkan** kadar berlakunya kecederaan tusukan jarum suntikan kepada mereka.*	**1**	**2**	**3**	**4**	**5**

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Section E: ATTITUDE

This part is to assess the level of HCW's tendency regarding NSI occurrence.

For every item, please choose your opinion based on the scale:

1	2	3	4	5
Very Disagree	**Disagree**	**Neutral**	**Agree**	**Very Agree**

1	I am worried about having needle stick injury. *Saya risau sekiranya saya mengalami kecederaan tusukan jarum suntikan.*	**1**	**2**	**3**	**4**	**5**
2	Patient care is **more important** than the safety of health care workers. *Penjagaan pesakit adalah **lebih penting** daripada keselamatan kakitangan kesihatan.*	**1**	**2**	**3**	**4**	**5**
3	All needlestick injuries at work should be reported immediately. *Semua kejadian kecederaan tusukan jarum suntikan di tempat kerja perlu dilaporkan dengan segera.*	**1**	**2**	**3**	**4**	**5**
4	In my opinion, needle stick injury is preventable. *Pada pendapat saya, kecederaan akibat tusukan jarum suntikan boleh dielakkan.*	**1**	**2**	**3**	**4**	**5**
5	Sharp objects waste should be managed by a professional company instead of a common domestic waste company. *Sisa objek tajam hendaklah diuruskan oleh pengendali sisa profesional dan bukannya melalui pengendali sisa domestik.*	**1**	**2**	**3**	**4**	**5**

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