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Knowledge and Attitude towards Pressure Ulcer Preventions among UNIMAS Undergraduate  
Nursing Students

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This project is submitted in partial fulfilment of the  
requirements for the degree of Bachelor of Nursing with Honours

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## DECLARATION

I hereby affirm that the research project entitled “*Knowledge and Attitude towards Pressure Ulcer Preventions among UNIMAS Undergraduate Nursing Students*” is my original work and has been conducted in full compliance with the regulations of Universiti Malaysia Sarawak. I further confirm that all sources of information and references have been properly cited and acknowledged throughout the text. This research has not been previously submitted, either in whole or in part, for the award of any academic qualification.



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## ABSTRACT

**Background:** A pressure ulcer (PU) is a localised injury that typically develops over bony prominences as a result of sustained pressure, often in combination with friction and shear forces that affect the epidermis and/or underlying tissues. Nursing students' knowledge and competence in preventing pressure ulcers are essential, as PUs are widely recognized as indicators of nursing care quality. **Objectives:** To identify the level of knowledge and attitude towards pressure ulcer preventions among undergraduate nursing students at Universiti Malaysia Sarawak (UNIMAS) and to examine the relationship between knowledge and attitudes in this context. **Methodology:** A cross-sectional study was conducted using simple random sampling. Data were collected from 163 undergraduate nursing students at UNIMAS. The Pressure Injury Prevention Knowledge (PIPK) and Attitude toward Pressure Ulcer Prevention (APuP) instruments were used in this study. **Results:** The findings revealed that a majority of participants demonstrated good knowledge ( $n = 133$ , 81.6%) and a positive attitude ( $n = 112$ , 68.7%) toward pressure ulcer prevention. The overall mean knowledge score was 68.4%, while the overall mean attitude score was 77.7%. A weak but statistically significant positive correlation was observed between knowledge and attitude ( $r = .181$ ,  $p = .021$ ). **Conclusion:** Although the nursing students exhibited generally good knowledge and positive attitudes regarding pressure ulcer prevention, the weak yet significant correlation suggests that knowledge alone may not be sufficient to influence attitudes or behaviour, highlighting the need for more integrative educational strategies.

*Keywords:* Pressure ulcer prevention, knowledge, attitude, nursing students, UNIMAS

## **ABSTRAK**

**Latar belakang:** Ulser tekanan (PU) ialah kecederaan yang biasanya berlaku pada bahagian tulang yang menonjol akibat tekanan berterusan, sering kali digabungkan dengan geseran dan daya ricih yang memberi kesan kepada epidermis dan/atau tisu lain. Pengetahuan dan kompetensi pelajar kejururawatan dalam mencegah ulser tekanan amat penting kerana PU diiktiraf sebagai petunjuk kepada kualiti penjagaan. **Objektif:** Mengenal pasti tahap pengetahuan dan sikap terhadap pencegahan ulser tekanan dalam kalangan pelajar kejururawatan prasiswazah di Universiti Malaysia Sarawak (UNIMAS), serta untuk meneliti hubungan antara pengetahuan dan sikap dalam konteks ini. **Metodologi:** Satu kajian keratan rentas telah dijalankan menggunakan persampelan rawak mudah. Data telah dikumpulkan daripada 163 orang pelajar kejururawatan prasiswazah di UNIMAS. Instrumen “Pressure Injury Prevention Knowledge (PIPK)” dan “Attitude toward Pressure Ulcer Prevention (APuP)” telah digunakan dalam kajian ini. **Hasil Kajian:** Kajian menunjukkan bahawa majoriti peserta mempunyai tahap pengetahuan yang baik ( $n = 133$ , 81.6%) dan sikap yang positif ( $n = 112$ , 68.7%) terhadap pencegahan ulser tekanan. Skor min keseluruhan bagi pengetahuan ialah 68.4%, manakala bagi sikap ialah 77.7%. Hubungan positif lemah tetapi signifikan antara pengetahuan dan sikap ( $r = .181$ ,  $p = .021$ ). **Kesimpulan:** Walaupun pelajar kejururawatan menunjukkan tahap pengetahuan yang baik dan sikap yang positif terhadap pencegahan ulser tekanan, korelasi yang lemah tetapi signifikan ini mencadangkan bahawa pengetahuan sahaja mungkin tidak mencukupi untuk mempengaruhi sikap atau tingkah laku. Hal ini menekankan keperluan untuk strategi pendidikan yang lebih integratif.

**Kata kunci:** Pencegahan ulser tekanan, pengetahuan, sikap, pelajar kejururawatan, UNIMAS.

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## **LIST OF ABBREVIATIONS**

|        |                                             |
|--------|---------------------------------------------|
| APuP   | Attitude toward Pressure Ulcer Prevention   |
| FMHS   | Faculty of Medicine and Health Sciences     |
| M      | Mean                                        |
| Mdn    | Median                                      |
| PIPK   | Pressure Injury Prevention Knowledge        |
| PU     | Pressure Ulcer                              |
| SD     | Standard Deviation                          |
| SPSS   | Statistical Package for the Social Sciences |
| UNIMAS | Universiti Malaysia Sarawak                 |

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.0 Introduction**

This chapter of the research consists of nine subsections, detailing the study's background, problem statement, research questions, aim, and objectives. The researcher elucidates the importance of this research topic, defines relevant words, including both conceptual and operational definitions, and provides a summary of the chapter.

#### **1.1 Background of study**

A pressure ulcer (PU) is a localised lesion that frequently develops on bony prominences resulting from pressure in conjunction with friction forces and/or shears on bony prominences. The lesion is on the epidermis and/or underlying tissue (Wu et al., 2022). The nursing students' level of understanding and skill in preventing pressure ulcers (PUs) is crucial, as pressure ulcers serve as indicators of nursing care quality. Pressure ulcers are severe complications for immobile patients, financially burdening healthcare facilities. The importance of understanding the prevention of pressure ulcers cannot be overstated, as these injuries not only result in patient discomfort and extended hospital stays but also contribute to healthcare expenses and can result in severe complications such as sepsis and infections. According to a recent investigation conducted at a university hospital in Malaysia's peninsula, the surgical and medical departments had a varied pressure ulcer prevalence between 7% to 10%, contingent upon the immobility and comorbidities of the patient (Shahadan et al., 2024). Meanwhile, in a recent meta-analysis and systematic review published in 2020, the global prevalence of pressure

injuries shows an average of 12.8% with an average rate of 5.4 per 10,000 patient days among adult hospitalised patients worldwide (Li et al., 2020).

Pressure ulcers continue to be prevalent in numerous healthcare facilities despite the existence of preventive measures and guidelines. Inconsistent applications of preventive strategies, deficits in knowledge, and resource constraints may be responsible for this issue (Wu et al., 2022). As prospective healthcare providers, nursing students must be adequately equipped to manage pressure ulcer prevention in clinical environments. Thus, it is imperative to underscore the importance of nursing students' early enrolment in nursing programs, which should focus on preventing and managing existing pressure ulcers upon patient admission (Abrahams et al., 2023).

## **1.2 Problem statement**

Pressure ulcers, commonly known as bedsores, constitute a significant issue within the healthcare sector, mainly affecting patients who are immobile or critically ill. Even with healthcare improvement, pressure ulcers remain prevalent, leading to more significant patient discomfort, extended hospitalisation, and higher healthcare expenses (Kısacık & Sönmez, 2020). Research conducted in various global regions consistently demonstrated an increased pressure ulcer incidence rate, although the publication of clinical guidelines was introduced worldwide (Halaz et al, 2021; Wu et al., 2022; Hermis et al, 2023). Both Wu et al. (2022) and Larimi et al. (2023) also mentioned that the nursing students' current knowledge level of preventing pressure is still insufficient. In particular, the current preparedness of undergraduate nursing students in Malaysia is poorly documented due

to limited recent research regarding the knowledge and attitude of nursing students on preventing pressure ulcers in Malaysia over the past five years.

A study at Lincoln College Malaysia concentrated solely on pressure ulcer prevention knowledge (40.2%), neglecting to consider the attitude concerning their level of knowledge (Murugiah et al., 2020). In contrast, the only study prominent on pressure ulcer prevention was by Isa et al. (2019), which assessed both knowledge and attitude among undergraduate students in nursing in Universiti Teknologi MARA (UiTM), indicating poor knowledge (45.4%); however, positive attitude was reported.

Additionally, the inconsistent findings on the association between knowledge and attitude regarding preventing pressure ulcers among students in nursing have also become a leading gap when in Malaysia, research conducted on 157 undergraduate nursing students reported that there was no association between knowledge and attitude (Isa et al., 2019). Meanwhile, a study in Saudi Arabia stated a moderately positive correlation between attitude and knowledge level among 50 final-year nursing students (Alshahrani et al., 2021). In contrast, there is a positive weak relationship between two variables among 259 nursing students in a private university in Turkey (Dag Sucu & Firat Kilic, 2022). Furthermore, research regarding the prevention of pressure ulcers among undergraduate nursing students at UNIMAS has not been comprehensively conducted, as there are targeted studies addressing pressure ulcer prevention within UNIMAS or universities in Sarawak. Therefore, there is a lack of data to address the potential knowledge gaps regarding preventing pressure ulcers in their education and attitudes.

### **1.3 Research aim, questions, and research objectives**

#### **1.3.1 Research aim**

The primary purpose of this study is to identify the knowledge level and attitude regarding pressure ulcer prevention among the UNIMAS undergraduate nursing students in order to gain insights into their current level of understanding and perspectives relevant to clinical practice.

#### **1.3.2 Research questions**

- i. What is the level of knowledge among UNIMAS undergraduate nursing students regarding pressure ulcer prevention?
- ii. What is the attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students?
- iii. Is there any relationship between the knowledge and attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students?

#### **1.3.3 Research objectives**

- i. To identify the level of knowledge among UNIMAS undergraduate nursing students regarding pressure ulcer prevention.
- ii. To evaluate the attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students.
- iii. To determine the relationship between the knowledge and attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students.

## **1.4 Hypotheses**

### **1.4.1 Null hypothesis ( $H_0$ )**

There is no significant relationship between knowledge level and attitude toward preventing pressure ulcers among UNIMAS undergraduate nursing students.

### **1.4.2 Alternative hypothesis ( $H_A$ )**

There is a significant relationship between knowledge level and attitude toward preventing pressure ulcers among UNIMAS undergraduate nursing students.

## **1.5 Significance of the study**

### **1.5.1 Nursing students**

This study provides insights into existing knowledge and attitudes of nursing students regarding pressure ulcer prevention. Through the identification of specific strengths and deficiencies, the findings may enhance students' self-awareness and understanding of their current level of preparedness. This awareness has the potential to promote critical reflection and cultivate a more informed, responsible, and professional attitude toward pressure ulcer prevention as they transition into clinical practice.

### **1.5.2 Nursing education**

The research findings provide valuable comprehension for the nursing programme developers to pinpoint deficiencies of knowledge and enhance the training of nursing students in both theory courses and clinical stimulation classes such as Fundamentals of Nursing, Concept and Practice of Basic Nursing, and Medical-Surgical Nursing courses in the preliminary nursing year thus when the

curriculum syllabus are empowered with strong adherence to pressure ulcer prevention this will ensure that these students are more adequately equipped to conduct safe patient care.

### **1.5.3 Patient care**

This study can help improves patient safety, enhance their quality of life, and lower healthcare costs associated with prolonged hospital stays by identifying gaps in the level of knowledge and the viewpoint of students in nursing regarding the prevention of pressure ulcers.

## **1.6 Operational definition of terms**

### **i. Knowledge of pressure ulcer prevention**

**Conceptual definition:** Knowledge is defined as the understanding or awareness of facts, details, or principles related to a specific subject, gained through personal experience or focused study, and can be held by an individual or collectively shared among a group (Gilanig, 2022).

**Operational Definition:** Knowledge referred to the assessment of knowledge using the Pressure Injury Prevention Knowledge (PIPK) questionnaire developed by Lopez-Franco et al. (2020) which comprised 20 items on a Dichotomous scale of "True and False". An overall score spanned from 0 to 20, with elevated scores indicating a greater degree of understanding. The analysis of knowledge level in this study was classified into Poor, 0% to 59% and Good, which falls into 60% to 100%.

**ii. Attitude toward pressure ulcer prevention**

**Conceptual definition:** The Cambridge Dictionary (2023) outlined that attitude pertains to a sentiment, viewpoint, or manner of conduct towards something or someone.

**Operational definition:** The assessment of attitude using the Attitude Toward Pressure Ulcer Prevention Instrument (APuP) developed by Beeckman et al. (2010) which consisted of 12 questions rated on a five-point Likert Scale. Each item was assigned a score that was based on a scale of 1 to 5, where “Strongly Disagree = 1,” “Disagree = 2,” “Neutral = 3,” “Agree = 4”, and “Strongly Agree = 5”. Items numbered 3, 4, 5, 7, 8, 9, and 12 are negative statements. The overall attitude score varied from 12 to 60, with elevated scores signifying a prominent positive attitude.

**iii. Pressure ulcer prevention**

**Conceptual definition:** Pressure ulcers, also known as pressure injuries or bedsores, are localised damage to the skin and underlying soft tissue caused by sustained pressure and shear forces, typically occurring over areas with bony prominences (Zaidi & Sharma, 2024).

**Operational definition:** In this study, it referred to the pressure ulcer prevention by UNIMAS undergraduate nursing students. Two sets of instruments were delivered to evaluate the level of knowledge and attitude regarding pressure ulcer prevention.

**iv. Undergraduate nursing students**

**Conceptual definition:** An undergraduate nursing student is someone who is enrolled in a Bachelor of Nursing programme in an accredited School of Nursing to prepare the students for a role as a registered nurse according to the Malaysian Nursing Board (MNB) (Walker & Rossi, 2021).

**Operational definition:** In this study, it referred to the undergraduates who are enrolled in the Bachelor of Nursing at UNIMAS from Year 1 until Year 4.

## **1.7 Summary**

In conclusion, this chapter outlined the foundation of the study, which aims to assess the knowledge and attitude of UNIMAS undergraduate nursing students toward pressure ulcer prevention. Despite existing guidelines, pressure ulcers remain prevalent due to inconsistent preventive practices and knowledge gaps. Limited local research, especially in Sarawak, has explored both knowledge and attitude in this context. The study seeks to address this gap by examining the nursing students' current understanding and attitudes, with objectives focused on identifying knowledge levels, evaluating attitudes, and determining any relationship between those two variables. The significance of the study lies in its potential to inform nursing education, gain insights into the current knowledge level, and ultimately improve patient care outcomes. Key terms are operationally defined to ensure clarity and alignment with the study's objectives.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter will provide a comprehensive overview of the existing literature about pressure ulcers. Specifically, the study will investigate undergraduate nursing students' knowledge, attitudes, and the relationship between the knowledge and attitudes regarding preventing pressure ulcers. These literature reviews showed that pressure ulcers are of concern in many countries. The articles incorporated into this literature review have been sourced from reputable platforms, including Google Scholar, ResearchGate, Wiley Online Library, and PubMed. Additionally, to ensure currency, the literature spans the past five years, from 2019 to 2024. Moreover, to ensure vigorous research, it is crucial to evaluate the quality of studies by assessing their methodology, sample size, reliability, and validity while prioritising those with robust methods and significant findings. The keywords used were knowledge, attitudes, nursing students, and pressure ulcer prevention.

#### **2.1 Knowledge regarding pressure ulcer prevention among undergraduate nursing students**

Pressure ulcer prevention is a fundamental aspect of patient care, with significant implications for patient outcomes and healthcare costs. Effective prevention requires foundational knowledge among healthcare providers, particularly nursing students, who are future frontliners in patient care. On the other hand, the body of knowledge is essential as it allows nurses to improve patient safety, make better decisions, and provide the utmost care during hospital stays (Smith et al., 2021). This means that knowledge of

preventing pressure ulcers is an imperative competency for nursing students, as it prepares them to recognise and mitigate one of the most common preventable conditions in clinical settings (Hammad et al., 2024). Hammad et al. (2024) suggest that preventing pressure ulcers necessitates a multifaceted strategy, incorporating supportive surfaces, repositioning, and overall care, including risk assessment, skin evaluation, and nutritional considerations. Hammad et al. (2024) conducted a descriptive and a cross-sectional study consisting of Palestinian students in nursing with a total sample of 455. The researcher found an overall mean of 54% in the knowledge score. None of the students attained a score of 100%, and only 26.2% of nursing students attained a satisfactory knowledge score exceeding 60%. From this study, most of the students demonstrated a moderate level of knowledge in preventing pressure ulcers.

This study is concurrent with results obtained from a cross-sectional study done by Cukljek et al. (2022) among 114 Croatian nurses and 198 nursing students on pressure ulcer prevention knowledge, which revealed that both groups possessed poor knowledge level with a total correct score of 45.48% and 39.7% respectively. Only 4.8% of students achieved 60%, demonstrating adequate understanding of pressure ulcer preventive measures. Pressure ulcer education must be prioritized in the curriculum, adhering to the most recent standards for preventing and treating pressure ulcers. Cukljek et al. (2022) also mentioned the need to structure educational programs for nurses within lifelong learning and supplemented with practical experiences to foster critical thinking. Thus, it is imperative to ensure that nursing students possess adequate knowledge to effectively implement prevention methods that result in the proper use of measures and decrease pressure ulcer incidence (Booker, 2023).

Isa et al. (2019) conducted a cross-sectional study in a Malaysian public university consisting of 157 nursing students to evaluate the knowledge and attitude among Diploma and Degree nursing students. The findings obtained from this study showed that the participants had poor knowledge, with a mean score of 45.4%, and 7 out of 157 (4.5%) nursing students achieved a mean score of more than 60%. The researcher also mentioned that a lack of knowledge may be related to non-compliance or poor compliance with the guidelines for preventing pressure ulcers.

These findings are also similar to the studies conducted in Palestine and Croatia by Hammad et al. (2024) and Cukljek et al. (2022), respectively. These three studies suggest that the knowledge about pressure ulcer prevention is still inadequate in Malaysia and worldwide. Another study was carried out by Chami et al. (2023) to evaluate the knowledge level of 285 nursing students in Northern Morocco. However, only 242 nursing students completed the questionnaire, with a response rate of 84.9%. From this study, Chami et al. (2023) concluded that Northern Morocco nursing students probably possessed the poorest mean score in the knowledge level of preventing pressure ulcers (23.52%) compared to most studies that assessed the same value. A comprehensive analysis revealed that one contributing cause to the poor knowledge among Moroccan nursing students is the lack of adopted textbooks or standardized curricula provided to the participants. Preventing pressure ulcers necessitates evidence-based practices and the provision of equipment and material resources, including skin protection items and support surfaces.

These studies highlight that nursing students only achieved around 50% on standardised assessments, below the 60% threshold considered inadequate for pressure ulcer prevention knowledge. This signified a scarcity of awareness and knowledge regarding preventing pressure ulcers across different geographical regions. Current education may not adequately emphasised the critical aspects of pressure ulcer prevention, especially in practical areas such as reducing pressure or shear forces and correctly repositioning patients which are vital skills for patient safety.

Additionally, Bahar et al. (2024) conducted a cross-sectional descriptive study involving 426 nursing students from two Turkish institutions. The study revealed a total mean knowledge score of 59%, indicative of a moderate level of knowledge among the participants. Moreover, a substantial knowledge deficiency was observed in the preventative measures, with 68.3% of nursing students reporting the most often incorrect responses. Consequently, these findings underscore the necessity for thorough educational strategies and practical experiences to augment knowledge for efficient pressure ulcer prevention.

## **2.2 Attitude toward pressure ulcer prevention among undergraduate nursing students**

An individual's performance is primarily influenced by their attitude, which is a key factor in decision-making and a reliable indicator of behaviour (Haddock et al., 2020). Properly evaluating attitudes toward preventing pressure ulcers is an important way to recognise plans to improve how nursing students view pressure ulcers (Isa et al., 2019). According to Isa et al. (2019), the most significant concern in attitudes toward preventing pressure ulcers is a lack of confidence in the effectiveness of prevention.

Out of 157 nursing students, 100 (63.7%) agreed that they have confidence in preventing pressure ulcer development and 27 (17.2%) strongly agreed that they were well prepared and trained to avoid pressure ulcers. Similarly, in a descriptive cross-sectional study conducted by Hammad et al. (2024) Palestinian nursing students had a positive attitude, with 55.4% of the students achieving a satisfactory attitude level of more than 75% and a mean attitude score of 75.8%. The researcher indicated notable differences in the total attitude score associated with clinical experiences, the number of departments attached, and academic year during clinical posting. This concept aligns with Isa et al. (2019) and Kara et al. (2021), who stated that students in the nursing field with more clinical practices and years of study have more positive attitudes toward preventing pressure ulcers.

Furthermore, Hammad et al. (2024) suggest that high attitude scores in nursing students showed significant recognition of the role of individual accountability and commitment in mitigating the possibilities of pressure ulcers. In contrast, a cross-sectional study at a Saudi Arabian university reported that the attitude level toward preventing pressure ulcers among nursing students was relatively unsatisfactory compared to those in other countries (Al Gharash et al., 2024). From the total score of 52 on the 13 items in Attitude towards Preventing Pressure Ulcer (APuP), 161 participants scored a mean score of 61.36%, indicating unsatisfactory attitude rates (satisfactory rates >75%).

According to Kara et al. (2021), several factors contributed to the low attitudes among nursing students, including insufficient knowledge and skills in managing pressure ulcers. Their theoretical knowledge and clinical skills shape the attitudes exhibited by nursing students. Furthermore, a recent descriptive multi-method study design conducted by Zito et al. (2024) in two universities in Italy seeks to depict the attitude of the nursing students during post-pandemic regarding pressure ulcers. The study stipulated that among 97 nursing students, the students have moderate attitude scores of 78.19% on the APuP scale.

The primary concern identified was personal competency in preventing pressure ulcers (68.55%), which is a factor contributing to noncompliance with established pressure ulcer prevention guidelines in professional conduct. This result is due to insufficient self-confidence in their skills or education to prevent the emergence of pressure ulcers, which corresponds with the findings outlined by Isa et al. (2019). Findings from these research studies indicated that most nursing students exhibit positive attitudes toward preventing pressure ulcers (75% and above satisfactory level), with only one study showing a contradictory pattern. Also, the studies highlighted the influence of sociodemographic factors on these outcomes, particularly concerning the students' clinical experience and year of study.

### **2.3 Relationship between knowledge and attitude toward pressure ulcer prevention among undergraduate nursing students**

The relationship between knowledge and attitudes toward preventing pressure ulcers among students in nursing varies between studies. Understanding how these factors relate to nursing students is essential, as they influence students' readiness and commitment to applying preventive measures. Alshahrani et al. (2021) conducted a study at a Saudi Arabian institution to evaluate the attitude and knowledge of the students in nursing about preventing pressure ulcers and thus found that the correlation coefficient statistics indicated a moderate positive correlation between knowledge and attitude ( $r = 0.414, p = 0.05$ ).

Additionally, a university in Turkey investigated a study regarding the correlation between 259 Turkish students in nursing on the knowledge and attitude regarding preventing pressure ulcers, revealing a positive but relatively low correlation between the scores of the two variables, which is  $r = 0.131, p < 0.005$  (Dag Sucu & Firat Kilic, 2022).

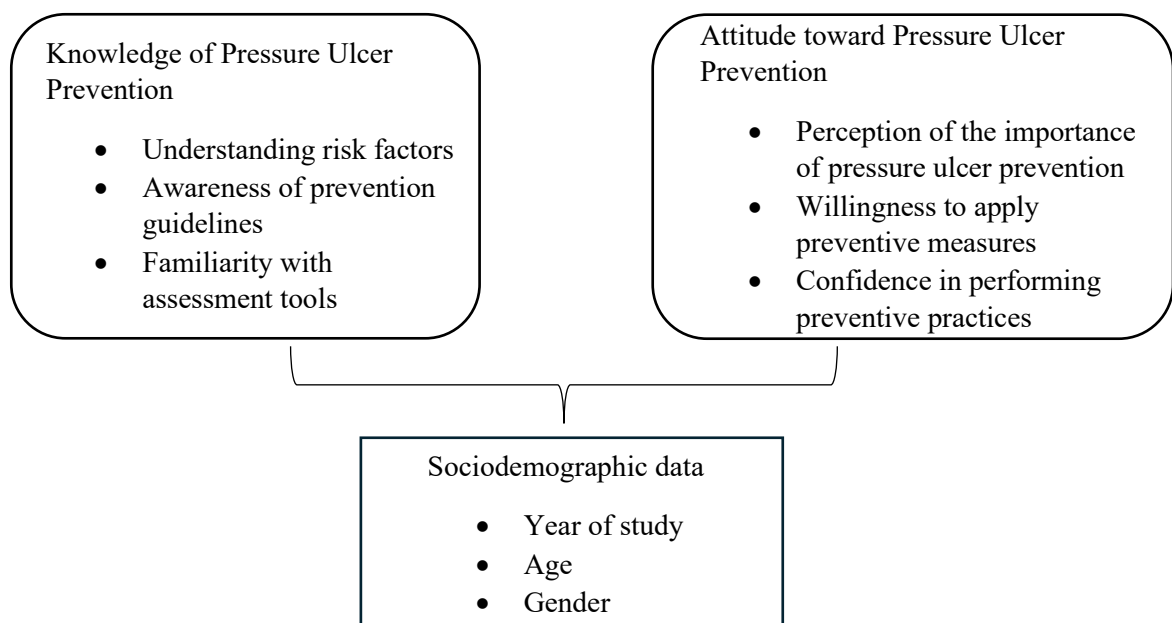
In contrast, there are disparities in the outcomes shown in a study by Isa et al. (2019). Isa et al. (2019) reported that the study to assess the knowledge and attitude associated with preventing pressure ulcers in a public university in Malaysia revealed that there is no correlation between knowledge and attitudes which was shown by a Spearman correlation test ( $r = .132, p < .01$ ). This indicates that knowledge alone does not necessarily determine attitudes. In this study, nursing students have poor knowledge of

pressure ulcer prevention yet still maintain a positive attitude toward its importance and practice. This may be due to repeated exposure and increased confidence gained through hands-on practice. Additionally, nursing students in the early years of study or less experienced may have less practical knowledge yet still hold a positive attitude towards prevention due to encouragement from clinical instructors or the ethical culture within the institution (Isa et al., 2019).

## 2.4 Conceptual Framework

**Figure 2.1**

*Conceptual framework*



This conceptual framework depicted the correlation between knowledge and attitudes towards pressure ulcer prevention among undergraduate nursing students, influenced by sociodemographic characteristics as the moderating role.

The knowledge domain includes comprehension of risk factors, awareness of prevention guidelines, and familiarity with assessment tools, all of which are vital for effective preventive measures. The attitude domain encompasses recognising the importance of pressure ulcer prevention, the willingness to implement preventive measures, and having confidence in performing practices. Sociodemographic data, including the year of study, age, and gender, are integrated as variables that not only influence knowledge and attitude individually but also affect the relationship between these two variables.

## **2.5 Summary**

Studies have shown that nursing students in various countries frequently demonstrated knowledge deficiency on preventing pressure ulcer, with studies across regions such as Palestine, Croatia, Malaysia, Turkey, and Morocco showing knowledge scores typically below the acceptable threshold of 60% on the pressure ulcer prevention knowledge. This deficit suggests gaps in educational curricula, particularly in hands-on practice like repositioning and shear-force reduction. Conversely, attitude toward pressure ulcer prevention differ across nursing students; some exhibit high confidence and a strong commitment to prevention, driven by clinical experiences and academic level, while others demonstrate diminished confidence. Furthermore, the correlations between knowledge and attitudes vary by academic year, exhibiting considerable positive relationships in certain regions while showing no meaningful relationship in others. These findings highlighted the necessity for educational reform to enhance knowledge and practical skills in pressure ulcer prevention among nursing students.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.0 Introduction**

This chapter will be organised into thirteen distinct sections. The first section provides a detailed explanation of the research designs, followed by the second and third sections, which individually address the research setting and the chosen population for this study. This chapter also describes the inclusion and exclusion criteria, followed by the sampling method and sample size in detail. Additionally, the next sections provide a detailed description of the study instrument, as well as its reliability and validity. Furthermore, this chapter also delineates the ethical considerations process and the pilot study execution. The data analysis technique and data collection procedure will be explained in the following section. Finally, a conclusion for this chapter was provided.

#### **3.1 Research design**

This study employed a cross-sectional quantitative design. According to Simkus (2023), quantitative research involves systematically collecting and analysing numerical data. This design facilitated a cross-sectional study to determine the relationship between knowledge levels and attitudes among undergraduate nursing students at UNIMAS. This study utilised a cross-sectional approach to evaluate knowledge and attitudes concurrently within a defined population at a given time.

Correlational analysis facilitates examining the relationships between variables without researcher intervention or the establishment of causality (Bhandari, 2022). Wang and Cheng (2020) emphasised that cross-sectional designs are cost-effective and easy to

conduct. A cross-sectional quantitative study has been chosen due to its compatibility with this research's time and budget constraints.

### **3.2 Research setting**

This research took place in the Faculty of Medicine and Health Sciences (FHMS) at Universiti Malaysia Sarawak (UNIMAS), a public university located in Kota Samarahan, Sarawak. The faculty provided a comprehensive four-year Bachelor of Nursing with Honours course, which constituted the educational basis for the participants in this study. Therefore, given its comprehensive role in delivering theoretical education and clinical skill training, this faculty was selected as the study site.

### **3.3 Population**

There are 234 undergraduate nursing students in the Bachelor of Nursing programme at the Faculty of Medicine and Health Sciences, UNIMAS.

### **3.4 Sampling method and sample size**

#### **3.4.1 Sampling method**

In this study, the sample size included participants from undergraduate nursing students from Year 1 to Year 4 at UNIMAS. The chosen sampling method was simple random sampling, a prevalent technique in quantitative research utilising survey instruments. This technique was advantageous in uniform and homogeneous selected populations, guaranteeing that everyone has an equal opportunity to participate in the study, with the selection process relying solely on probability (Noor et al., 2022).

Noor et al. (2022) also stated that this approach guaranteed that the population was represented fairly, with no bias and equal chances for all individuals involved. A population census has been conducted to develop a comprehensive inventory of nursing students. Every participant had been assigned a random number. A randomiser number generator was used to select participants until the required sample size was attained. The sample size was obtained using Taro Yamane's formula, which offered clear means to ascertain the requisite sample size for a study. The sample size determination was predicated on the population of undergraduate nursing students for this study at the University of Malaysia Sarawak, N=234.

### 3.4.2 Sample size

**Table 3.1**

*Sample size calculation method*

|                                 |                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------|
| Taro Yamane Formula             |                                                                                               |
| $n = \frac{N}{1+N(e)^2}$        | Where $n$ = the sample size<br>N = the population size<br>$e$ = the acceptance sampling error |
| Calculation                     |                                                                                               |
| $n = \frac{234}{1+234(0.05)^2}$ | *95% confidence level and $p = 0.05$                                                          |
| = 147.6                         | Attrition rate:                                                                               |
| ≈ 148 participants              | 10% of the sample size =                                                                      |
|                                 | Sample size + (calculated sample size x 10%)                                                  |
|                                 | = 148 + (148 x 10/100)                                                                        |
|                                 | = 148 + 14.8                                                                                  |
|                                 | = 162.8 ≈ 163 participants                                                                    |

The study necessitated a sample size of 148 participants, as determined by calculations. The ultimate sample size consisted of 163 participants, accounting for a 10% attrition rate. This was intended to recompense the individuals who chose not to take part in the study.

### **3.5 Inclusion and exclusion criteria**

#### **3.5.1 Inclusion criteria**

This study involved undergraduate nursing students from Year 1 to Year 4 at the Universiti Malaysia Sarawak (UNIMAS), currently enrolled in the nursing programme, and participants who have attended or are presently attending the MDJ1704 Fundamentals of Nursing course.

#### **3.5.2 Exclusion criteria**

This research project excluded post-registration nursing students, participants recruited for the pilot study, and students who were hesitant or declined to consent to participate.

### **3.6 Research instrument**

This study utilised a questionnaire methodology that was tangible, namely printed on paper and personally delivered to the participants. Before utilising the questionnaire for this study or modifying and adapting it to align more effectively with the present investigation, consent has been obtained from the study authors (refer to Appendix E). The instrument was categorised into three sections which are A, B, and C.

Section A presented the sociodemographic details of the participants, encompassing information such as gender, age, religion, race, and year of study. This is an imperative tool for categorising and estimating the prevalence or sociological characteristics (Abdullahi, 2020) (refer to Appendix D).

Section B outlined the degree of knowledge of undergraduate nursing students in their understanding of pressure ulcer prevention based on the Pressure Injury Prevention Knowledge (PIPK) developed by Pérez-López et al. (2021) (refer to Appendix D). There were 20 items recorded as a dichotomous scale of True and False. The results were coded as incorrect if the participant answered incorrectly or opted for the "I do not know" option. The overall score varied from 0 to 20, with higher values signifying a greater degree of knowledge. One point was awarded if the participant provided a True response for each true statement; similarly, each false statement shall also earn one point if the participant provided a False response. The knowledge level was assessed and classified into two unique categories: Poor corresponded with 0% to 59% and Good corresponded with 60% to 100%.

In Section C, the evaluation of attitude toward pressure ulcer prevention was carried out using the Attitude on Pressure Ulcer Prevention (APuP) established by Beeckman et al. (2010) (refer to Appendix D). This section comprised 12 items, each with a score that were within the range of 12 to 60. Responses on a 4-point Likert scale were classified into “strongly disagree = 1 point”, “disagree = 2 points”, “agree = 3 points”, and “strongly agree = 4 points”. Items 3, 4, 5, 7, 8, 9, and 12 are negative statements. Higher scores

achieved by the participants indicated more excellent positive attitudes towards pressure ulcer prevention.

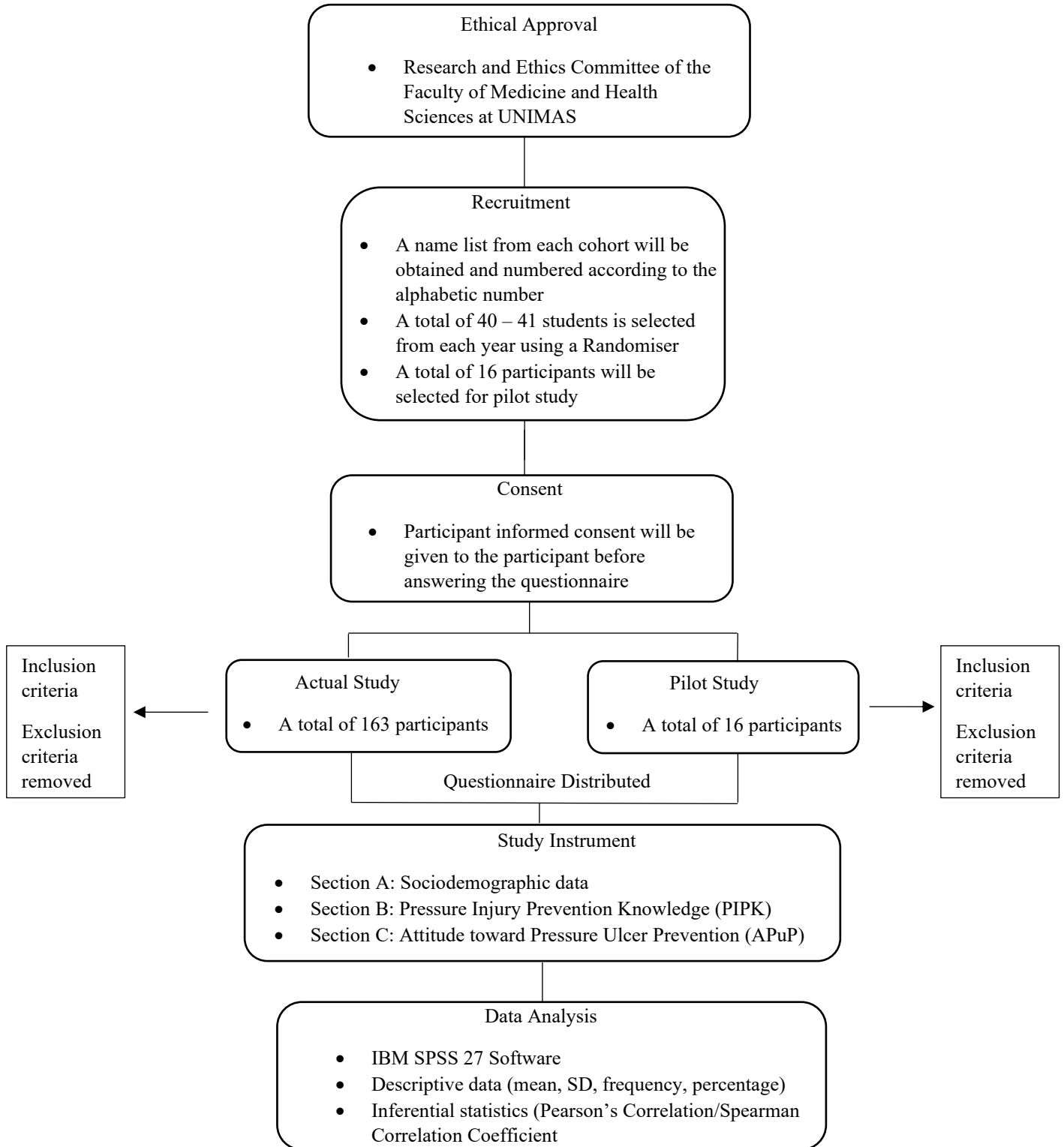
### **3.7 Ethical Considerations**

Before commencing this study, the author of the questionnaires was provided with a formal email requesting consent to utilise the questionnaire instruments (refer to Appendix E). Furthermore, ethical approval was secured from the Research and Ethics Committee of the Faculty of Medicine and Health Sciences at UNIMAS (refer Appendix A). Participants were given formal informed consent, signifying their willingness to engage in the research and the authority to withdraw from the research (refer to Appendix C). All material acquired in this investigation is confidential and discreetly applied to the research objectives. Access to the data is restricted to the researcher and their supervisor exclusively. All material acquired in the research was kept confidential and stored in the researcher's locked cabinet.

### 3.8 Data collection procedure

**Figure 3.1**

*Data collection procedure flow chart*



### 3.8.1 Pilot study

Before conducting the main study, a pilot study was carried out to establish the validity and reliability of the research instruments (Middleton, 2022). The objective of conducting the pilot study was to assist in evaluating the main study's viability and practicality, the effectiveness of the research tools, and to identify and address any weaknesses or logistical problems of the study (Simkus, 2023). According to In (2017), 10% of the sample size is enough to identify potential issues with the data collection methods or study instruments without incurring the cost and time commitment of a full-scale study. The pilot study was conducted by using Google Forms, and 16 participants were selected based on the actual sample size of the study were then excluded from the study to avoid bias as they answered the questionnaires. Data collected from the pilot study was analysed using the IBM SPSS Version 27.0 software to test the internal consistency of the questionnaires using Cronbach's Alpha correlation coefficient. In this pilot study, the Cronbach's alpha for the Pressure Injury Prevention Knowledge (PIPK) instrument was 0.78, and the Attitude toward Pressure Ulcer Prevention (APuP) instrument was found to be 0.8. Hence, both questionnaires were reliable to be used for this research.

**Table 3. 2**

*Pilot study's sample size calculation*

|                                                                     |
|---------------------------------------------------------------------|
| <b>Formula: 10% calculated sample size including attrition rate</b> |
| = $10/100 \times 163$                                               |
| = 16.3                                                              |
| ≈ 16 participants                                                   |

**i. Reliability**

Reliability is denoted by the consistency of a procedure in measuring a particular variable (Middleton, 2022). Internal consistency constitutes a form of reliability. Internal consistency refers to the extent to which the scale's items evaluate the same characteristic (Nawi et al., 2020). According to Izah et al. (2023), Cronbach's Alpha score falls between 0.70 and 0.80, considered an acceptable and good internal consistency and reliability. A prior study by Bahar et al. (2024) reported a Cronbach's Alpha value of 0.89 for the Pressure Injury Prevention Knowledge (PIPK) questionnaire, which means it exhibited good consistency, while the Attitude toward Pressure Ulcer Prevention (APuP) questionnaire demonstrated a similar robust Cronbach's Alpha of 0.88 (Isa et al., 2019). The Cronbach's Alpha was obtained by utilizing SPSS IBM Version 27.0 software.

**ii. Validity**

A measure of validity is the degree to which the results accurately reflect the intended outcome (Middleton, 2022). The outcome is evaluated by examining how well it fits with formal theories and measurements of the same concept. In addition, good reliability means that the measuring process is valid (Middleton, 2022). Face validity is a criterion to evaluate how well a test, questionnaire, or measuring instrument subjectively appears to measure the variable for which it was designed (Chapman & Gillespie, 2019). It is a non-statistical preliminary evaluation that examines whether the items or instruments are appropriate and relevant to the study's objectives (Bhandari, 2022).

### **3.8.2 Actual study**

The data collection procedure involved obtaining a name list for each cohort of UNIMAS nursing students from the academic office. Post-registration students have been excluded from the list, and each participant was numbered according to alphabetical order and categorized according to their respective years of study. A sample size of 163 participants was obtained for the actual study using the Taro Yamane formula, and 40 to 41 students were selected from each year using a randomiser generator with equal probability. The participants were required to answer an informed consent before answering the questionnaire. The data analysis was conducted by entering and analysing the data received using the IBM SPSS 27.0 software.

### **3.9 Data analysis method**

Data analysis was conducted by utilising IBM SPSS Version 27.0 software, employing both descriptive and inferential approaches. Descriptive statistics encompassed sociodemographic data, knowledge levels, and attitudes on pressure ulcer prevention that were stipulated in the form of means, percentages, frequencies, standard deviation, and total scores. Additionally, the knowledge level was computed into a total score and was categorised into Poor (0% to 59%) and Good (60% to 100%) levels of knowledge, as the author had already ranged it accordingly for the instrument and displayed it as percentages. Furthermore, the attitude toward pressure prevention were computed into a total score and integrated into a positive attitude of more than 75% and a negative attitude of less than 75%. Based on its normality test, the relationship between the level of knowledge and attitude toward pressure ulcer prevention were examined using either of

these inferential statistics, the Pearson Correlation Coefficient or Spearman Correlation Coefficient.

### **3.10 Summary**

This chapter comprehensively explained the methods used to evaluate the knowledge and attitudes concerning pressure ulcer prevention among undergraduate nursing students at UNIMAS. It examined the relationship between the two variables. The research was conducted in the Faculty of Medicine and Health Sciences, UNIMAS, utilising a descriptive cross-sectional quantitative approach. The study involved 163 undergraduate nursing students as participants. The study instrument comprised three components, and formal informed consent was secured from the participant prior to questionnaire completion. Before data collection, ethical approval was obtained from the Faculty Research Committee. The data obtained in this study were analysed using IBM SPSS Version 27.0 software, applying both descriptive and inferential statistical methods.

## **CHAPTER 4**

### **RESULTS/FINDINGS**

#### **4.0 Introduction**

This chapter presents the study's findings based on the research objectives of the study which consists of the sociodemographic characteristics of the participants, the knowledge and attitude towards pressure ulcer prevention among UNIMAS undergraduate nursing students, and inferential statistics to find the relationship between knowledge and attitudes toward pressure ulcer prevention among UNIMAS undergraduate nursing students. This chapter also shows the relationship between knowledge and attitude across age, gender, and year of study to analyse if the sociodemographic factors affect the knowledge and attitude of UNIMAS undergraduate nursing students toward pressure ulcer prevention. Furthermore, data analysis was conducted by using SPSS version 27. A total of 163 participants from Year 1 to Year 4 were involved in this study, that were calculated based on Taro Yamane's formula. Therefore, these results and findings represents a response rate of 100% from the participants in this study.

#### **4.1 Socio-demographic characteristics of the study sample**

A total of 163 undergraduate nursing students in UNIMAS were recruited in this study. The response rate reached 100%, which were 163 participants. There were no outliers or extreme values noted from the box plot for age. A Kolmogorov-Smirnov test showed a significant departure from normality,  $D(163) = .15$   $p < .001$ . The median age among participants is 22 years old ( $IQR = 2$  years old). The maximum age is 25 years old while the minimum age is 19 years old. The range is 6 years old. The mode 22 years old. (See Table 4.1 below).

There are no outliers or extreme values from screening the data. Out of 163 participants, 32 (19.6%) were male and 131 (80.4%) were female. Most of the participants were Malay (46%,  $n = 75$ ), followed by Bumiputera Sarawak (30.7%,  $n = 50$ ), Bumiputera Sabah (19%,  $n = 31$ ), Chinese (3.7%,  $n = 6$ ), and the least represented race was Indian (0.6%,  $n = 1$ ). Most of the participants were Muslim (60.7%,  $n = 99$ ), followed by Christian (38%,  $n = 62$ ), and both Buddha and Hindu had (0.6%,  $n = 1$ ) respectively. The analysis of the year of study showed almost an equal percentage of participation among the undergraduate nursing students. (Year 1; 24.5%, Year 2; 25.2%, Year 3; 25.2%, Year 4; 25.2%).

**Table 4.1**

*Socio-demographic variables of UNIMAS undergraduate nursing students ( $n = 163$ )*

| Characteristics              | Frequency (n) | Percentage (%) |
|------------------------------|---------------|----------------|
| <b>Age</b>                   |               |                |
| 19 years old                 | 3             | 1.8            |
| 20 years old                 | 30            | 18.4           |
| 21 years old                 | 38            | 23.3           |
| 22 years old                 | 42            | 25.8           |
| 23 years old                 | 33            | 20.2           |
| 24 years old                 | 16            | 9.8            |
| 25 years old                 | 1             | .6             |
| <b>M = 21.76, SD = 1.319</b> |               |                |
| <b>Gender</b>                |               |                |
| Male                         | 32            | 19.6           |
| Female                       | 131           | 80.4           |
| <b>Race</b>                  |               |                |
| Malay                        | 75            | 46             |
| Chinese                      | 6             | 3.7            |
| Indian                       | 1             | .6             |
| Bumiputera Sarawak           | 50            | 30.7           |
| Bumiputera Sabah             | 31            | 19             |

|                      |    |      |
|----------------------|----|------|
| <b>Religion</b>      |    |      |
| Islam                | 99 | 60.7 |
| Christian            | 62 | 38   |
| Buddha               | 1  | .6   |
| Hindu                | 1  | .6   |
| <b>Year of Study</b> |    |      |
| Year 1               | 40 | 24.5 |
| Year 2               | 41 | 25.2 |
| Year 3               | 41 | 25.2 |
| Year 4               | 41 | 25.2 |

Note: n: frequency, %: percentages, M; mean, SD; standard deviation.

#### **4.2 The level of knowledge regarding pressure ulcer prevention among UNIMAS undergraduate nursing students**

Table 4.2 presented the descriptives for the knowledge score of the participants according to the Pressure Injury Prevention Knowledge (PIPK). The most frequently answered item correctly was item 1 which was the recommendation to use devices or fabrics to reduce friction and shear forces during repositioning, with a mean score of 0.98 and a standard deviation of 0.155; meanwhile, the most frequently answered item incorrectly was item 9, with a notable misconception of the question of “*comprehensive skin assessment (head to toe) of all patients admitted to a facility (hospital or nursing home) may be done within the first 48 hours after admission.*” with a mean score of 0.03 and standard deviation of 0.173.

**Table 4.2**

*Descriptives of knowledge toward pressure ulcer prevention among UNIMAS undergraduate nursing students (n=163).*

| Item                                                                                                                                                                      | Correct    | Incorrect  | M<br>(SD)       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|-----------------|
|                                                                                                                                                                           | n (%)      | n (%)      |                 |
| 1. When repositioning patient in bed, use some device or fabric to reduce friction/shear forces and avoid dragging on the bed surface.                                    | 159 (97.5) | 4 (2.5)    | 0.98<br>(0.155) |
| 2. If dietary intake does not meet nutritional requirements, offer high-protein, high calorie supplements to adults who are at risk for pressure injuries.                | 141(86.5)  | 22 (13.5)  | 0.87<br>(0.343) |
| 3. When repositioning in bed, patients can be placed over reddened skin areas.                                                                                            | 127 (77.9) | 36 (22.1)  | 0.78<br>(0.416) |
| 4. Skin areas in contact with medical devices (such as masks or tubes) do not have a higher risk for developing pressure injuries.                                        | 127 (77.9) | 36 (22.1)  | 0.78<br>(0.416) |
| 5. Nurses should describe all pressure injuries using a standardized classification system.                                                                               | 153 (93.9) | 10 (6.1)   | 0.94<br>(0.241) |
| 6. A cotton and elastic bandage on the heels allow redistributing the pressure and preventing pressure injuries.                                                          | 12 (7.4)   | 151 (92.6) | 0.07<br>(0.262) |
| 7. In bedridden patients at risk of pressure injuries, a mattress with pressure relieving properties should be used instead of a standard mattress.                       | 157 (96.3) | 6 (3.7)    | 0.96<br>(0.189) |
| 8. Rubbing the skin with alcohol and massaging over bony prominences is useful to enhance capillary circulation.                                                          | 60 (36.8)  | 103 (63.2) | 0.37<br>(0.484) |
| 9. A comprehensive skin assessment (head to toe) of all patients admitted to a facility (hospital or nursing home) may be done within the first 48 hours after admission. | 5 (3.1)    | 158 (96.9) | 0.03<br>(0.173) |

|                                                                                                                                                                          |            |            |                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|-----------------|
| 10. Repositioning is not necessary in bedridden patients using a pressure-relief mattress.                                                                               | 134 (82.2) | 29 (17.8)  | 0.82<br>(0.384) |
| 11. The seat tilt should be adequate to reduce pressure and shear forces on the skin of at-risk patients while sitting.                                                  | 130 (79.8) | 33(20.2)   | 0.80<br>(0.403) |
| 12. In at-risk bedridden patients, keep semi-incorporated with head elevated between 30° and 45°.                                                                        | 9 (5.5)    | 154 (94.5) | 0.06<br>(0.229) |
| 13. All risk assessments performed must be registered in the patient's medical record.                                                                                   | 156 (95.7) | 7 (4.3)    | 0.96<br>(0.203) |
| 14. Nutritional status should be assessed when the patient is admitted to a health facility or a major change in his/her health status happens.                          | 157 (96.3) | 6 (3.7)    | 0.96<br>(0.189) |
| 15. The length of the surgery is not a risk factor for the development of pressure injuries.                                                                             | 99 (60.7)  | 64 (39.3)  | 0.61<br>(0.490) |
| 16. Use a donut-shaped device to relieve the pressure in at-risk patients with reduced mobility.                                                                         | 10 (6.1)   | 153 (93.9) | 0.95<br>(0.214) |
| 17. Examine the skin for signs of redness, areas of non-blanchable erythema, localized heat, induration, or skin breakdown in individuals at risk for pressure injuries. | 155 (95.1) | 8 (4.9)    | 0.95<br>(0.217) |
| 18. The amount of time an individual spends sitting still does not influence the development of pressure injuries.                                                       | 127 (77.9) | 36 (22.1)  | 0.78<br>(0.416) |
| 19. Systematically use a validated risk assessment scale (Braden, Norton or EMINA).                                                                                      | 126 (77.3) | 37 (22.7)  | 0.77<br>(0.420) |
| 20. In bedridden patients, monitor the skin in high-risk areas for pressure injuries (such as the heels, sacrum, occipital, nose, and hips).                             | 156 (95.7) | 7 (4.3)    | 0.96<br>(0.203) |

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Note: n: Frequency; %: Percentages; M: mean; SD: standard deviation.

Table 4.3 depicted the level of knowledge toward pressure ulcer prevention among UNIMAS undergraduate nursing students. The total score of knowledge was recoded into level of knowledge using a visual binning method and was further divided into two groups which were poor (11 and below) and good (12 and above). Visual binning creates new variables based on the classifying researcher's continuous data into selected number of defined groups (Nasir et al., 2022). Most participants scored a good level of knowledge toward pressure ulcer prevention, which was 133 participants (81.6%) meanwhile 18.4%, 30 participants among the UNIMAS undergraduate nursing students fell into the poor category, which scored below 11 out of 20 questions. The maximum score of the knowledge level toward pressure ulcer prevention was 18 while the minimum score of the knowledge level was 10 out of 20.

**Table 4.3**

*Level of knowledge toward pressure ulcer prevention among UNIMAS undergraduate nursing students (n = 163)*

|                                       | The level of knowledge towards pressure ulcer prevention, n (%) |            |           |
|---------------------------------------|-----------------------------------------------------------------|------------|-----------|
|                                       | ≤ 11                                                            | ≥ 12       | Min (Max) |
|                                       | (Poor)                                                          | (Good)     |           |
| UNIMAS undergraduate nursing students | 30 (18.4)                                                       | 133 (81.6) | 10 (18)   |

*Figure 4.1 Bar chart of the level of knowledge toward pressure ulcer prevention among UNIMAS undergraduate nursing students.*

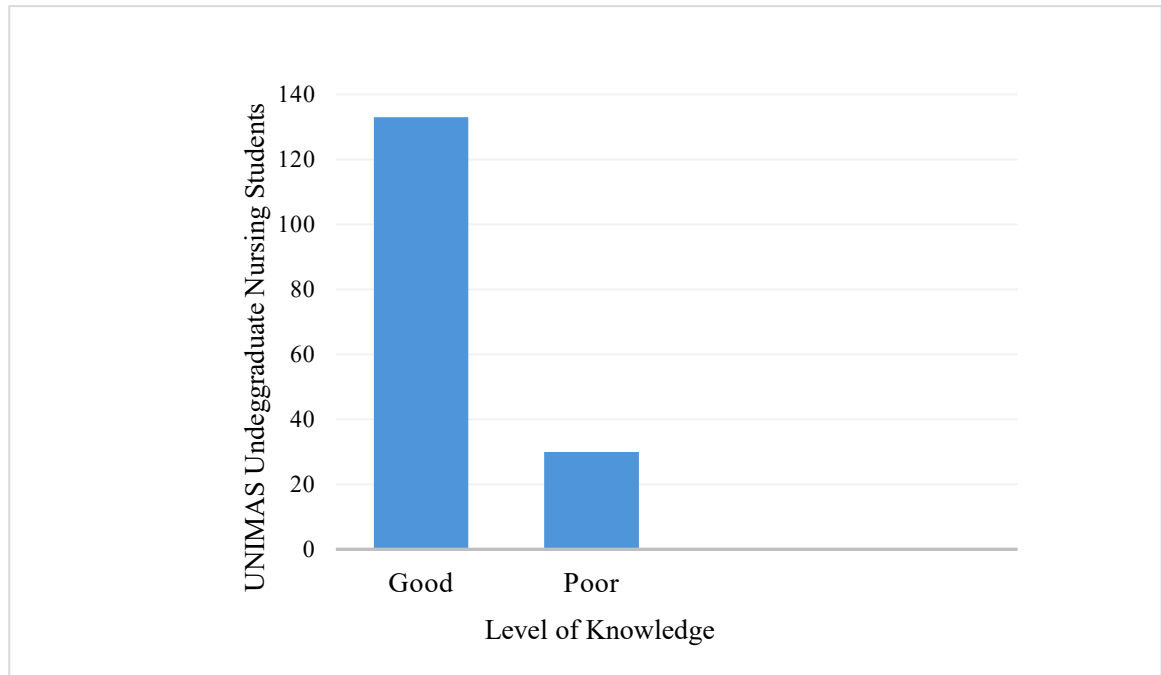


Table 4.4 presents the mean knowledge score by year of study among 163 participants. The findings indicated a progressive increase in mean scores from Year 1 to Year 4. Specifically, Year 1 nursing students reported a mean score of 13.28 (SD = 2.439) while Year 4 nursing students demonstrated the highest mean score among the year of study with a mean score of 14.73 (SD = 1.265). Furthermore, Year 4 also showed the lowest standard deviation of 1.265, suggesting greater consistency in knowledge level among final-year participants. The overall mean knowledge score for the 20-item questions of PIPK across all years of study was 13.67 (SD = 2.00).

**Table 4.4***Mean knowledge scores by year of study (n = 163)*

| <b>Year of study</b> | <b>n</b> | <b>Mean</b> | <b>Standard Deviation</b> |
|----------------------|----------|-------------|---------------------------|
| Year 1               | 40       | 13.28       | 2.439                     |
| Year 2               | 41       | 12.66       | 2.020                     |
| Year 3               | 41       | 14.02       | 1.491                     |
| Year 4               | 41       | 14.73       | 1.265                     |
| Total                | 163      | 13.67       | 2.000                     |

### **4.3 The attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students**

Table 4.5 presented the descriptives attitude score of the participants according to the Attitude toward Pressure Ulcer Prevention instrument (APuP). The total mean score for the 12-item questions of APuP was 46.63 with a standard deviation of 4.322. The item “Pressure ulcer prevention is not that important” was reported to have the highest mean score of 4.37 with a standard deviation of 0.685, meanwhile, the item “too much attention goes to the prevention of pressure ulcers” has the lowest mean score of 3.01 with a standard deviation of 0.991.

**Table 4.5**

*Descriptives of attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students (n = 163).*

| <b>Item</b>                                                   | <b>Strongly disagree</b> | <b>Disagree</b> | <b>Neutral</b> | <b>Agree</b> | <b>Strongly agree</b> | <b>M (SD)</b> |
|---------------------------------------------------------------|--------------------------|-----------------|----------------|--------------|-----------------------|---------------|
|                                                               | <b>n(%)</b>              | <b>n(%)</b>     | <b>n(%)</b>    | <b>n(%)</b>  | <b>n(%)</b>           |               |
| 1. I feel confident in my ability to prevent pressure ulcers. | 0(0)                     | 3(1.8)          | 34(20.9)       | 104(63.8)    | 22(13.5)              | 3.89 (0.638)  |

|                                                                                    |          |          |          |              |          |                     |
|------------------------------------------------------------------------------------|----------|----------|----------|--------------|----------|---------------------|
| 2. I am well trained to prevent pressure ulcers.                                   | 0(0)     | 2(1.2)   | 55(33.7) | 83<br>(50.9) | 23(14.1) | 3.78<br>(0.6<br>94) |
| 3. Pressure ulcer prevention is too difficult. Others are better than I am         | 15(9.2)  | 57(35)   | 60(36.8) | 25<br>(15.3) | 6(3.7)   | 3.31<br>(0.9<br>64) |
| 4. Too much attention goes to the prevention of pressure ulcers.                   | 11(6.7)  | 41(25.2) | 55(33.7) | 50<br>(30.7) | 6(3.7)   | 3.01<br>(0.9<br>91) |
| 5. Pressure ulcer prevention is not that important.                                | 74(45.4) | 79(48.5) | 7(4.3)   | 2(1.2)       | 1(.6)    | 4.37<br>(0.6<br>85) |
| 6. Pressure ulcer prevention should be a priority.                                 | 4(2.5)   | 4(2.5)   | 14(8.6)  | 76<br>(46.6) | 65(39.9) | 4.19<br>(0.8<br>79) |
| 7. A pressure ulcer almost never causes discomfort for a patient.                  | 85(52.1) | 62(38)   | 7(4.30)  | 5<br>(3.1)   | 4(2.5)   | 4.34<br>(0.8<br>92) |
| 8. The financial impact of pressure ulcers on a patient should not be exaggerated. | 31(19)   | 62(38)   | 47(28.8) | 19<br>(11.7) | 4(2.5)   | 3.60<br>(1.0<br>04) |
| 9. I am not responsible if a pressure ulcer develops in my patients.               | 78(47.9) | 68(41.7) | 9(5.5)   | 7(4.3)       | 1(.6)    | 4.32<br>(0.8<br>14) |
| 10. I have an important task in pressure ulcer prevention.                         | 5(3.1)   | 3(1.8)   | 16(9.8)  | 84<br>(51.5) | 55(33.7) | 4.11<br>(0.8<br>82) |
| 11. Pressure ulcers are preventable in high-risk patients.                         | 4(2.5)   | 10(6.1)  | 45(27.6) | 75<br>(46)   | 29(17.8) | 3.71<br>(0.9<br>16) |
| 12. Pressure ulcers are almost never preventable.                                  | 34(20.9) | 84(51.5) | 31(19)   | 12<br>(7.4)  | 2(1.2)   | 3.83<br>(0.8<br>84) |

Note: n: Frequency; %: Percentages; M: mean; SD: standard deviation.

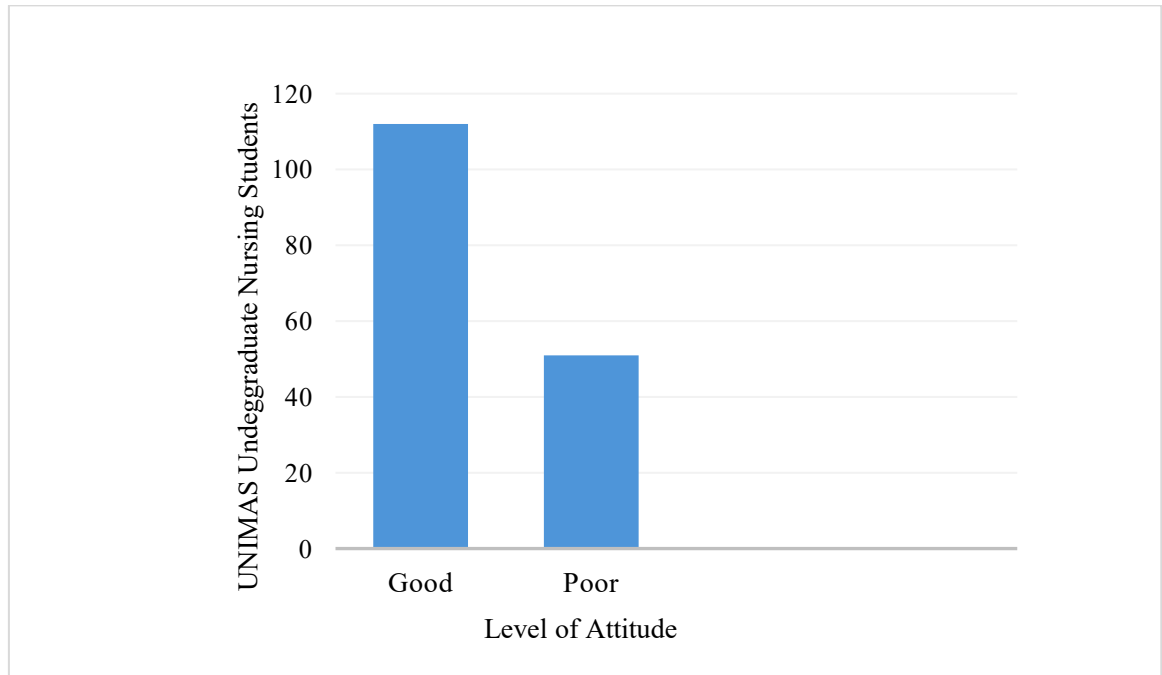
Table 4.6 depicted the attitude level of UNIMAS undergraduate nursing students towards pressure ulcer prevention. The level of attitude was divided into two categories, which were positive attitude, 75% (45 and above), and negative attitude that falls under 75% (44 and below). The total score of attitude was recoded into a level of attitude using a visual binning method. Over half of the participants reported a positive attitude toward pressure ulcer prevention ( $n = 111$ , 68.7%), while 51 (31.3%) out of 163 were reported to have negative attitude. The maximum score for the attitude level among UNIMAS undergraduate nursing students was 56, while the minimum score was 36 out of 60.

**Table 4.6**

*The level of attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students ( $n = 163$ )*

|                                                  | The level of attitude toward pressure ulcer prevention,<br>n(%) |            |           |
|--------------------------------------------------|-----------------------------------------------------------------|------------|-----------|
|                                                  | $\leq 44$                                                       | $\geq 45$  | Min (Max) |
|                                                  | (Negative)                                                      | (Positive) |           |
| <b>UNIMAS undergraduate<br/>nursing students</b> | 51 (31.3)                                                       | 112 (68.7) | 36 (56)   |

Figure 4.2 Bar chart of the level of attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students.



#### 4.4 Inferential statistics

##### 4.4.1 Normality test for knowledge and attitude toward pressure ulcer prevention

Table 4.7 presented the normality test for the total score of knowledge and attitude among UNIMAS undergraduate nursing students toward pressure ulcer prevention. A normality test was utilized to identify whether the data collected from the sample were normally or not normally distributed and to decide which statistical test should be used for the inferential statistics part of this study. A Kolmogorov-Smirnov test has been used as the sample size for this study exceeded 50 samples ( $n = 163$ ). There were no outliers or extreme values noted from the box plot for the knowledge score. A Kolmogorov-Smirnov test showed a significant departure from normality,  $D(163) = .15$ ,  $p < .001$ . The median score among participants is 14 points ( $IQR = 2$  points). The maximum score is 18 points, while the minimum score is 10 points. The range is 8 points. The mode score

is 14 points. Additionally, no outliers and extreme values are noted from the box plot for the attitude total score. A Kolmogorov-Smirnov test does not follow a normal distribution,  $D(163) = .08, p = .015$ . The median score is 47 points ( $IQR = 6$  points). The maximum score is 59 points, while the minimum score is 36 points. The range is 23 points. The mode score is 47 points.

**Table 4.7**

*Normality test for knowledge and attitude.*

|                  | Kolmogorov-Smirnov <sup>a</sup> |     |       | Shapiro-Wilk |     |       |
|------------------|---------------------------------|-----|-------|--------------|-----|-------|
|                  | Statistic                       | df  | Sig.  | Statistic    | df  | Sig.  |
| <b>Knowledge</b> | .147                            | 163 | <.001 | .942         | 163 | <.001 |
| <b>Attitude</b>  | .079                            | 163 | .015  | .975         | 163 | .005  |

#### **4.4.2 The relationship between knowledge and attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students.**

The normality test revealed that the distribution of data was not normally distributed (refer table 4.7). Thus, a non-parametric test was used for this study. The relationship between knowledge and attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students was investigated using Spearman correlation coefficient (refer table 4.8). Based on the table below, preliminary analyses were performed, and the assumption of normality was violated. No outliers or extreme values were detected from the box plot.

According to Papagergiou (2022), the strength of correlation  $r = 0.01 - 0.19$  indicated very weak relationship,  $0.20 - 0.29$  indicated weak relationship,  $0.30 - 0.39$  indicated moderate relationship,  $0.40 - 0.69$  indicated strong relationship, and  $> 0.70$  indicated very strong relationship.

A Spearman's rho correlation was performed to assess the relationship between participants' knowledge of pressure injury prevention (PIPK) and their attitudes toward pressure ulcer prevention (APuP). The analysis showed a weak positive correlation between the total scores of PIPK and APuP, which was statistically significant ( $r = .181$ ,  $p = .021$ ). This indicates that higher knowledge scores were associated with slightly more positive attitudes toward pressure ulcer prevention among the participants.

**Table 4.8**

*The relationship between knowledge and attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students (n=163).*

|                |           | Correlations            |           |          |
|----------------|-----------|-------------------------|-----------|----------|
| Spearman's rho | Knowledge |                         | Knowledge | Attitude |
|                |           | Correlation Coefficient | 1.000     | .181*    |
|                |           | Sig (2-tailed)          |           | .021     |
|                | Attitude  | N                       | 163       | 163      |
|                |           | Correlation Coefficient | .181*     | 1.000    |
|                |           | Sig (2-tailed)          | .021      |          |
|                |           | N                       | 163       | 163      |

\*Correlation is significant at the 0.05 level (2-tailed)

#### **4.5.2 The relationship between age with knowledge and attitude**

A Spearman's rho correlation was conducted to examine the relationship between age and the knowledge regarding pressure ulcer prevention. Preliminary analyses were performed and found that the assumptions of normality were violated,  $D(163) = .15$ ,  $p < .001$ . no outliers or extreme values were detected from the box plot. Results indicated a positive and statistically significant correlation between age and knowledge,  $r(163) = .261$ ,  $p < .001$ . This indicated that knowledge tends to increase with age, although the strength of its association was weak.

Meanwhile, the relationship between age and attitude toward pressure ulcer prevention was examined through preliminary analyses, which found that the assumptions of normality were violated,  $D(163) = 0.08$ ,  $p = 0.015$ . No outliers or extreme values were detected from the box plot. The analysis revealed a weak and non-significant correlation between the two variables,  $r(163) = .066$ ,  $p = .405$ . This suggests that no statistically significant correlation exists between age and attitude among undergraduate nursing students in UNIMAS.

**Table 4.9***Spearman's Correlation test between age with knowledge and attitude*

|                |           | Correlations            |        |        |       |
|----------------|-----------|-------------------------|--------|--------|-------|
| Spearman's rho | Age       | Correlation Coefficient | 1.000  | .261** | .066  |
|                |           | Sig. (2-tailed)         |        | <.001  | .405  |
|                |           | N                       | 163    | 163    | 163   |
|                | Knowledge | Correlation Coefficient | .261** | 1.000  | .181* |
|                |           | Sig. (2-tailed)         | <.001  |        | .021  |
|                |           | N                       | 163    | 163    | 163   |
|                | Attitude  | Correlation Coefficient | .066   | .181*  | 1.000 |
|                |           | Sig. (2-tailed)         | .405   | .021   |       |
|                |           | N                       | 163    | 163    | 163   |

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

\* Correlation is significant at the 0.05 level (2-tailed).

#### 4.5.3 The relationship between gender and knowledge

A Mann-Whitney U test was conducted to compare the total knowledge score between males and females. Preliminary analyses were performed and found that the assumptions of normality were violated,  $D(163) = .15$ ,  $p < .001$ . no outliers or extreme values were detected from the box plot. A Mann-Whitney U Test revealed no significant differences in the knowledge level of males ( $Mdn = 13.5$ ) and females ( $Mdn = 14$ ),  $U(163) = 1770$ ,  $p = .17$ .

**Table 4.10***Mann-Whitney U test for total score of knowledge by gender*

| <b>Gender</b> | <b>n</b> | <b>%</b> | <b>Median</b> | <b>SD</b> | <b>U</b> | <b>Asymp. Sig (2-tailed)</b> |
|---------------|----------|----------|---------------|-----------|----------|------------------------------|
| <b>Male</b>   | 32       | 19.63    | 13.5          | 2.477     | 1770.0   | .168                         |
| <b>Female</b> | 131      | 80.4     | 14            | 1.854     |          |                              |

Note: n: frequency; %: percentage; SD: standard deviation

**4.5.4 The relationship between gender and attitude**

A Mann-Whitney U test was conducted to compare the total attitude score between males and females. Preliminary analyses were performed and found that the assumptions of normality were violated,  $D(163) = .08$ ,  $p = .015$ . no outliers or extreme values were detected from the box plot. A Mann-Whitney U test revealed a significant difference in the attitude level of males ( $Mdn = 48.5$ ) and females ( $Mdn = 46$ ),  $U(163) = 1540$ ,  $p = .02$ .

**Table 4.11***Mann-Whitney U test for total score of attitude by gender*

| <b>Gender</b> | <b>n</b> | <b>%</b> | <b>Median</b> | <b>SD</b> | <b>U</b> | <b>Asymp. Sig (2-tailed)</b> |
|---------------|----------|----------|---------------|-----------|----------|------------------------------|
| <b>Male</b>   | 32       | 19.63    | 48.5          | 4.154     | 1540.0   | .020                         |
| <b>Female</b> | 131      | 80.4     | 46            | 4.291     |          |                              |

Note: n: frequency; %: percentage; SD: standard deviation

**4.5.5 The relationship between knowledge and year of study**

A Kruskal-Wallis test was conducted to explore the impact year of study on the level of knowledge, as measured by the Pressure Injury Prevention Knowledge (PIPK). Participants were divided into four groups according to their year of study. Preliminary analyses were performed, and it was found that there is a violation of the assumptions of

normality,  $D(163) = .15, p < .001$ . no outliers or extreme values were detected from the box plot. A Kruskal-Wallis test revealed a statistically significant difference in knowledge level across the year of study,  $H(3, 163) = 23.42, p < .001$ . Year 4 recorded a significantly higher median score ( $Mdn = 15$ ) than Year 3 ( $Mdn = 14$ ), Year 2 ( $Mdn = 13$ ), and Year 1 ( $Mdn = 13$ ).

**Table 4.12**

*Kruskal- Wallis H test for total score of knowledge across four different years of study.*

|                         | Total score of knowledge |
|-------------------------|--------------------------|
| <b>Kruskal-Wallis H</b> | 23.424                   |
| <b>N</b>                | 163                      |
| <b>df</b>               | 3                        |
| <b>Asymp. Sig</b>       | <.001                    |

Note: N: total sample; df: degree of freedom

**Table 4.13**

*Median total score of knowledge across four different years of study*

|               |          | Total score | of            | knowledge |                |                |
|---------------|----------|-------------|---------------|-----------|----------------|----------------|
| <b>Year</b>   | <b>n</b> | <b>%</b>    | <b>Median</b> | <b>SD</b> | <b>Minimum</b> | <b>Maximum</b> |
| <b>Year 1</b> | 40       | 24.5        | 13            | 2.439     | 10             | 18             |
| <b>Year 2</b> | 41       | 25.2        | 13            | 2.020     | 10             | 16             |
| <b>Year 3</b> | 41       | 25.2        | 14            | 1.491     | 11             | 18             |
| <b>Year 4</b> | 41       | 25.2        | 15            | 1.265     | 12             | 17             |

Note: n: frequency; %: percentage; SD: standard deviation

#### **4.5.6 The relationship between attitude and year of study**

A Kruskal-Wallis test was conducted to explore the impact year of study on the level of attitude, as measured by the Attitude toward Pressure Ulcer Prevention (APUP). Participants were divided into four groups according to their year of study. Preliminary analyses were performed, and it was found that there is a violation of the assumptions of

normality,  $D(163) = .08, p = .015$ . no outliers or extreme values were detected from the box plot. A Kruskal-Wallis test revealed non statistically significant difference in attitude level across the year of study,  $H(3, 163) = 4.31, p = .23$ . Year 4 recorded a slightly higher median score ( $Mdn = 48$ ) than Year 3 ( $Mdn = 47$ ), Year 2 ( $Mdn = 45$ ), and Year 1 ( $Mdn = 47$ ).

**Table 4.14**

*Kruskal-Wallis H test for total score of attitude across four different years of study*

|                  | Total score of attitude |
|------------------|-------------------------|
| Kruskal-Wallis H | 4.306                   |
| N                | 163                     |
| df               | 3                       |
| Asymp. Sig       | .230                    |

Note: N: total sample; df: degree of freedom

**Table 4.15**

*Median total score of attitude across four different years of study.*

|        |    |      | Total score of attitude |       |         |         |
|--------|----|------|-------------------------|-------|---------|---------|
| Year   | n  | %    | Median                  | SD    | Minimum | Maximum |
| Year 1 | 40 | 24.5 | 47                      | 4.112 | 39      | 55      |
| Year 2 | 41 | 25.2 | 45                      | 4.965 | 39      | 56      |
| Year 3 | 41 | 25.2 | 47                      | 4.243 | 39      | 55      |
| Year 4 | 41 | 25.2 | 48                      | 3.878 | 39      | 54      |

Note: n: frequency; %: percentage; SD: standard deviation

#### 4.6 Summary

In summary, it has been shown that most UNIMAS undergraduate nursing students had good knowledge regarding pressure ulcer prevention, where the mean score was 13.67 (SD = 2.00), and more than half of the participants  $n = 133$  (81.6%) showed good knowledge pertaining to pressure ulcer prevention as they have score more the score of 12 which was equivalent to more than 60% of the maximum score (Table 4.3). Furthermore, most of the participants also showed good attitude towards pressure ulcer prevention 112 (68.7%) meanwhile 51 (31.3%) of them showed negative attitude (Table 4.6). The overall mean score for attitude toward pressure ulcer prevention was 46.63 (SD = 4.322). The Spearman Correlation test has been used in this study and showed there was a weak positive correlation between knowledge and attitude toward pressure ulcer prevention [ $r = .181, p = .021$ ] (Table 4.8).

## **CHAPTER 5**

### **DISCUSSION**

#### **5.0 Introduction**

This chapter discusses the study's results, which are presented in different sections based on the research objectives. In this chapter, the level of knowledge on pressure ulcer prevention, attitude towards pressure ulcer prevention, and their relationship will be discussed further in detail. Furthermore, the main result will be summarised accordingly, and future recommendations will be discussed based on the implications of this study. Lastly, the limitations encountered throughout this study and the conclusion will be discussed at the end of the chapter. This study aimed to examine the relationship between the level of knowledge on pressure ulcer prevention and attitude towards pressure ulcer prevention, which are significant variables in identifying the knowledge gaps and eliminating dementia stigma among nursing students.

#### **5.1 Knowledge regarding pressure ulcer prevention among UNIMAS undergraduate nursing students**

The findings of this study revealed that the majority of UNIMAS undergraduate nursing students possess a good level of knowledge regarding pressure ulcer prevention. Specifically, 81.6% of the participants (n = 133) achieved a score indicative of good knowledge (68.4%), suggesting most of the nursing students understand the early intervention to prevent pressure ulcers among hospitalised patients. This result is consistent with the findings reported by Abrahams et al. (2023) in Namibia, where a similarly good level of knowledge was observed among the nursing students. However, 18.4% of the nursing students (n = 30) have concerning levels of knowledge regarding

pressure ulcer prevention, where the student nurses scored below 11 out of 20 from the questionnaire, categorizing them as having poor knowledge. The concern regarding patient risk due to inadequate knowledge of pressure ulcers aligns with findings by Dalvand et al. (2018) and Furtado et al. (2022), who reported that the development of pressure ulcers is closely linked to insufficient knowledge and lack of competence in pressure ulcer management among nursing students.

Additionally, the findings from this study differ from those reported by Murugiah et al. (2020) and Isa et al. (2019), who found that student nurses exhibited low levels of knowledge regarding pressure ulcer prevention. The high proportion of students demonstrating good knowledge in this study may reflect the effectiveness of the current nursing curriculum at UNIMAS, particularly in its emphasis on preventive strategies and the use of validated risk assessment tools such as the Braden and Norton scale in theoretical classes. This finding contrasts with those reported by Isa et al. (2019) and Murugiah et al. (2020), where nursing students exhibited limited knowledge in these particular areas. The possible justification of the discrepancy may be attributed to differences in curriculum content, teaching methodologies, or the extent of clinical exposure provided during training (Challa et al., 2021). These results suggest that a structured and comprehensive approach to pressure ulcer education, as seen in the UNIMAS curriculum, may contribute substantially to strengthening nursing students' theoretical knowledge and preparedness for clinical practice.

Furthermore, although the overall knowledge level among the participants is good, Item 9 which is “*A comprehensive skin assessment (head to toe) of all patients admitted to a facility may be done within the first 48 hours after admission*” was the most frequent answered incorrectly whereby only 3.1% (n = 5) of the participants answered correctly. A similar pattern was observed in the study by Bahar et al. (2024), where nursing students also showed uncertainty regarding the recommended time frame for initial skin assessment. This suggests a possible gap in the student nurses’ understanding of early assessment protocols, which are critical for the timely identification and prevention of pressure ulcers (Wan et al., 2023). The possible justification could be due to different standards of precaution adhered to by various institutions, potentially contributing to confusion among the nursing students. This finding underscores the need to emphasize guideline-based timelines in both theoretical teaching and clinical supervision to ensure that nursing students develop a consistent and accurate understanding of pressure ulcer prevention practices (Du et al., 2021).

There was one question with the highest correct response, where most of the participants were able to answer correctly, consisting of 159 (97.5%) of the nursing students. Based on the question regarding knowledge on pressure ulcer prevention item 1, it showed that most of the participants know that pressure ulcers can be prevented by using devices or fabric to avoid shear/friction during patient repositioning. This indicates strong awareness among students of the importance of mechanical interventions in pressure ulcer prevention, which is a key component of best practices advocated by international guidelines (Gillespie et al., 2020). The participants in this study were able to score in this question than in the previous study by Shoukat et al. (2025) as only 88.2% were able to

answer it correctly. The other statement with the highest correct answers among the participants is the question on item 7, whereby 157 (96.3%) answered it correctly. The participants in this current study were also able to score higher than previous study by Shoukat et al. (2025), as only 74.2% were able to answer it correctly. This proved that the participants had good knowledge despite a lack of timely skin assessment, obsolete practices regarding the use of donut-shaped devices, and massage over the reddened skin areas, which is also seen in the previous study by Chami et al. (2023).

The disparity between high performance on intervention-based items and low performance on assessment-related items suggests a potential imbalance in students' understanding across different phases of pressure ulcer management. While students seem confident in recognizing and applying preventive strategies, their knowledge of systematic risk assessment procedures remains limited.

Aside from that, a subsequent analysis was conducted to examine the relationship between participants' sociodemographic characteristics and their level of knowledge regarding pressure ulcer prevention. The findings revealed a statistically significant association between both age and year of study with knowledge, as each variable showing a p-value of less than .001. Thus, these two variables did impact the knowledge level of pressure ulcer prevention among UNIMAS nursing students. The findings were consistent with a study by Isa et al. (2019) which stated that older adults have good knowledge than the younger adults when dealing with pressure ulcer and Kısacık and Sönmez (2020) which reported that there is a significant increase in the knowledge levels of the nursing students who are in the fourth year of the nursing programme rather than

the second-year nursing students. Therefore, the observed increase in knowledge levels among participants across different years of study and age groups may be linked to the cumulative clinical experience acquired during their hospital placements.

## **5.2 Attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students**

The findings revealed that the majority of the undergraduate nursing students at UNIMAS demonstrated a positive attitude toward pressure ulcers, with a mean attitude score of 77.9%, particularly achieving good attitude in the personal competency to prevent pressure ulcers. However, unlike the current study, Hammad et al. (2024) reported that the participants showed higher awareness in prioritizing pressure ulcer prevention, which may reflect differences in curriculum emphasis. The attitude level of the participants in this study was found to be almost similar to the study conducted by Hammad et al. (2024), Hermis et al. (2023) and Isa et al. (2019) which found that the nursing students possessed a positive mean attitude score toward pressure ulcer prevention of 75.8%, 75.01%, and 75.3% respectively. However, unlike the current study, Alsharani et al. (2021) reported that the nursing students fell short of the 75% threshold with a mean score of 64.9%. These differences in the attitude results could be due to most of the participants in this study had completed clinical attachments in various wards with high-risk patients, which may have heightened their appreciation for preventive care and influenced their responses positively.

Furthermore, a notable finding in this study discovered that participants exhibited a generally low level of confidence in preventing pressure ulcers, which aligns with previous studies conducted by Usher et al. (2018) and Kısacık and Sönmez (2020), where nursing students similarly demonstrated limited self-assurance in the ability to implement effective preventive measures. This consistency suggests a persistent gap in educational preparation or practical exposure related to pressure ulcer prevention. The comparable attitudes observed may indicate that, despite good theoretical knowledge by the participants in this study, students may lack hands-on experience or reinforcement through clinical practice, which is essential for building confidence (Günay & Kılınç, 2018). According to Kısacık and Sönmez (2020), limited training and a formal education background concerning wound care management may affect the attitude level of nursing students. These findings underscore the need to strengthen simulation-based learning to provide nursing students with realistic, hands-on experience to bolster both technical skills and clinical judgment in a safe environment (Alrashidi et al., 2023).

Additionally, participants in the current study demonstrated strong agreement with the statement that *“pressure ulcer prevention should be a priority,”* as reflected by a high mean score of 4.19 (SD = 0.879). Specifically, 46.6% of the participants agreed and 39.9% strongly agreed, indicating a clear positive attitude toward the importance of preventive care. This positive perception may be attributed to several factors, including recent clinical exposure, ongoing discussions about patient safety, and the curricular emphasis placed on wound care within the nursing program at UNIMAS. These findings are consistent with Kısacık and Sönmez (2020), who reported that nursing students were receptive to pressure ulcer prevention strategies and recognized them as a priority.

Similarly, Dag Sucu and Firat Kilic (2022) found that nursing students generally regarded pressure ulcer prevention as a key nursing responsibility. However, in contrast, some studies conducted in other regions, as reported by Halaz et al. (2021) and Alshahrani et al. (2021), have highlighted less favourable attitudes, suggesting that such perceptions may vary depending on educational and institutional emphasis. Overall, the positive attitude observed in this study reinforces the importance of integrating prevention-focused content in nursing education and supports the potential for students to adopt best practices in clinical care.

### **5.3 Relationship between knowledge and attitude toward pressure ulcer prevention among UNIMAS undergraduate nursing students**

Spearman's rho correlation coefficient test revealed a weak positive and statistically significant relationship between the level of knowledge and attitude towards pressure ulcer prevention ( $r = .181, p = .021$ ). Similar findings were reported by previous studies by Kara et al. (2021), in which their research showed a weak positive relationship between the knowledge scores and the attitude scores ( $r = .158, p < .001$ ). Likewise, a study by Isa et al. (2019) also indicated that a weak yet statistically significant positive relationship was observed between knowledge and attitude ( $r = .132, p < .01$ ). This implies that nursing students with greater knowledge levels tend to exhibit more positive attitudes (Bahar et al., 2024).

Although the correlation is weak, the significant association suggests that knowledge plays a foundational role in shaping attitudes. According to Mather et al. (2022) as nursing students acquire more information about pressure ulcer prevention, they may

develop more empathy and awareness, leading to a positive shift in their attitudes. This supports the idea that education contributes to not just cognitive understanding but also emotional and motivational readiness to engage in preventive practices. The weak correlation coefficient suggests that while knowledge contributes to attitude, it is not a sole determinant. Therefore, efforts to improve attitudes should also address these other influencing factors.

#### **5.4 Summary findings of the study**

This study revealed that undergraduate nursing students at Universiti Malaysia Sarawak (UNIMAS) generally demonstrated good knowledge and a positive attitude regarding preventing pressure. Although a weak yet statistically significant link between knowledge and attitude was identified, the results indicate that other factors may also influence students' perceptions and behaviours. Notably, students performed better in intervention-related knowledge than in assessment-based areas, such as early skin assessment protocols. Additionally, age and academic year showed significant associations with knowledge level, as both age and year of study advanced, there was a corresponding increase in knowledge. These findings underscore the importance of adopting integrated educational approaches that not only deliver theoretical content but also foster the development of professional values, clinical reasoning, and practical skills essential for effective pressure ulcer prevention.

## **5.5 Implications for nursing students and nursing education**

### **5.5.1 Nursing students**

The result of this study showed that although student nurses possessed generally good knowledge and positive attitude toward pressure ulcer prevention, the weak yet significant correlation between the two suggests that knowledge alone is insufficient to influence behaviour. This underscores the need for students to engage in learning experiences that go beyond the theoretical syllabus. Activities such as case-based discussions and reflective learning can help students develop not only cognitive understanding but also empathy, accountability, and clinical reasoning (Mather et al., 2022). Furthermore, the observation that senior and older participants possessed better knowledge implies that early and repeated exposure to clinical environments may enhance learning outcomes among less experienced student nurses.

### **5.5.2 Nursing education**

From an educational perspective, the study highlights the necessity of adopting more integrated teaching approaches within the nursing curriculum. Rather than treating knowledge and attitude formation as separate domains, curriculum planners should design instruction that combines theory with values-based learning. In addition, identified gaps in areas such as early skin assessment protocols emphasize the importance of aligning academic content with clinical expectations. This alignment can be achieved through consistent messaging and collaboration between academic institutions and clinical sites to reinforce guideline-based practices during student placements (Bester et al., 2024). Lastly, the study points to a need for further research into additional factors that shape students' attitudes and confidence, such as mentorship

quality, ward culture, and emotional resilience, to better support the holistic development of future nurses.

### **5.6 Limitations of the study**

Several limitations were identified in this study. First and foremost, the generalizability of the findings is limited, as the research was confined to nursing students from the Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak (UNIMAS), excluding nursing students from other institutions across Malaysia. Moreover, the study was conducted within a limited timeframe due to the short academic semester and the participants' involvement in both theoretical coursework and practicum, which may have constrained data collection and participant availability. Lastly, the possibility of response bias, as participants might have been inclined to respond in a manner that aligns with perceived social norms rather than their actual knowledge or attitudes, potentially affecting the accuracy and authenticity of the data collected through the questionnaire.

### **5.7 Recommendations for future research**

Based on the study's findings and limitations, future research is encouraged to broaden its scope by including nursing students from various institutions throughout Malaysia. A broader, more diverse sample would enhance the generalizability of findings and allow for comparative analysis between different educational settings and curricula. It is also recommended that future research investigate the role of specific educational interventions such as simulation-based learning, interprofessional education, or mentorship programs in enhancing both knowledge and attitudinal outcomes. Evaluating

the effectiveness of these methods could inform the development of more targeted and evidence-based teaching strategies.

### **5.8 Conclusions**

This study highlights the current level of knowledge and attitude of UNIMAS undergraduate nursing students. Despite the good level of knowledge and attitude, gaps remain in certain areas of preventing pressure ulcer and their practical readiness, which could impact the quality of patient care. Strengthening educational interventions and clinical training are crucial to equip future nurses with the necessary competence to effectively prevent pressure ulcers and uphold high standards in nursing care.

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## APPENDICES

### Appendix A: Research Approval Letter

Pejabat Akademik  
**Fakulti Perubatan dan Sains Kesihatan**  
*Academic Office*  
*Faculty of Medicine & Health Sciences*  
☎: 581000 samb 7768  
📠: 665152

**UNIVERSITI MALAYSIA**  
**SARAWAK**  
94300 Kota Samarahan

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#### MEMORANDUM

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**Reference** : UNIMAS/NC-21.05/03-03 Jld. 8(144)

**To** : Schavera Elyiot Junik (78514)  
Bachelor of Nursing with Honours  
Faculty of Medicine and Health Sciences

**From** : Dean  
Faculty of Medicine and Health Sciences

**Date** : 05 March 2025

**Subject** : **Final Year Project - Research Approval: Knowledge and Attitude towards Pressure Ulcer Preventions among UNIMAS Undergraduate Nursing Students**

The above matter is referred.

The Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak (UNIMAS) has granted the **RESEARCH APPROVAL** for this Final Year Project research based on the appraisal by the Department of Nursing, Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak (UNIMAS) on 24 February 2025. The Final Year Project research details stated below:

**Student Name** : Schavera Elyiot Junik

**Student ID** : 78514

**Programme** : Bachelor of Nursing with Honours

**Research Title** : *Knowledge and Attitude towards Pressure Ulcer Preventions among UNIMAS Undergraduate Nursing Students*

**Supervisor Name** : Mr Md Fadlisham bin Samsuddin

**Supervisor H/P** : +60 12-984 5452

All records and data are to be kept strictly **CONFIDENTIAL** and can only be used for the purpose of this study. All precautions are to be taken to maintain data confidentiality. Permission from the all relevant heads of departments/units where the study will be carried out must be obtained prior to the study.

Please note that the approval is valid from **February 2025** to **November 2025** only. The reference number for this letter must be stated in all correspondence related to this study to facilitate the process.

Thank you with regards and well wishes.

Yours sincerely,



Professor Dr. Asri bin Said  
**Dean**

c.c : Deputy Dean of Undergraduate  
: Head of Nursing Department  
: Bachelor of Nursing with Honours  
: MDJ4653 Final Year Project 1 Course Coordinator

## **Appendix B: Cover Letter for Ethical Application**

**Schavera Elyiot Junik,**

Faculty Medicine and Health Sciences,  
Universiti Malaysia Sarawak,  
94300 Kota Samarahan,  
Sarawak.

**The Chairman,**

Medical Research Ethics Committee,  
Faculty Medicine and Health Sciences,  
Universiti Malaysia Sarawak,  
94300 Kota Samarahan,  
Sarawak.

15<sup>th</sup> December 2024

Professor/Associate Professor/Dr/Sir/Madam,

### **REQUEST FOR APPROVAL TO CONDUCT RESEARCH PROJECT**

I am a final-year student pursuing a Bachelor of Nursing with Honours at the Faculty of Medicine and Health Sciences, UNIMAS. I enrolled in MDJ 4653 Final Year Project I, in which the course is coordinated by Madam Shalin Lee Wan Fei. Please find my details as follows:

**Full name: Schavera Elyiot Junik**

**Matrix number: 78514**

**IC No.: 020211-12-0538**

I would like to request for the kind approval from the Faculty of Medicine and Health Sciences Medical Research Ethics Committee to conduct the following study:

**Research title:** Knowledge and Attitude towards Pressure Ulcer Preventions among UNIMAS Undergraduate Nursing Students.

**Supervisor's name:** Mr. MD Fadlisham bin Samsuddin

**Email address:** [smfadlisham@unimas.my](mailto:smfadlisham@unimas.my)

**Supervisor's HP number:** 012-9845452

Please find the required documents as appended for your kind consideration and approval.

Thank you.

Yours sincerely,



(Schavera Elyiot Junik)

## Appendix C: Participants' Informed Consent



### PARTICIPANT INFORMATION SHEET/ *MAKLUMAT KAJIAN PESERTA*

1. Title of the study : Knowledge and Attitude towards Pressure Ulcer  
Preventions among UNIMAS Undergraduate  
Nursing Students
2. Main Researcher : Schavera Elyiot Junik
3. Supervisor : a) Course Coordinator: Ms. Feryante  
Rintika anak Belansai  
b) Main research supervisor: Mr. MD  
Fadlisham bin Samsuddin
4. Insitution : Department of Nursing  
Faculty of Medicine & Health Sciences  
Universiti Malaysia Sarawak
5. Name of sponsor : No external funding

## **PARTICIPANT INFORMATION SHEET AND INFORMED CONSENT FORM**

(for adult subjects)

### **6. Introduction:**

It is important that you understand why the research is being done and what it will involve. Please take your time to read through and consider this information carefully before you decide if you are willing to participate. Ask the study staff if anything is unclear or if you would like more information. After you are properly satisfied that you understand this study, and that you wish to participate, you must sign this informed consent form.

Your participation in this study is voluntary. You do not have to be in this study if you do not want to. You may also refuse to answer any questions you do not want to answer. If you volunteer to be in this study, you may withdraw from it at any time. If you withdraw, any data collected from you up to your withdrawal will still be used for the study. Your refusal to participate or withdrawal will not affect any medical or health benefits to which you are otherwise entitled.

This study has been approved by the Medical Research and Ethics Committee, Ministry of Health Malaysia.

### **7. What is the purpose of the study?**

The purpose of this study is to assess the knowledge and attitude of undergraduate nursing students toward pressure ulcer prevention. This research is necessary to improve effective patient care practices and ensuring future nurses are equipped with the knowledge and skills to prevent pressure ulcers in clinical settings.

This research will be conducted for duration of 6 months (25/1/2025 till 30/6/2025). The expected number of participants is 163 individuals.

### **8. What are my responsibilities when taking part in this study?**

It is important that you answer all of the questions asked by the study staff honestly and completely which will take about 20 minutes of your time. You will be given a questionnaire to be answered. This form contains three sections that will enquire about your socio- demographic data, knowledge level on pressure ulcer prevention, and attitude toward pressure ulcer prevention.

**9. What are the potential risks and side effects of being in this study?**

Participation in this study will not affect your treatment, and the risk is minimal. You are free to decline to answer any of the questions that you feel uncomfortable with.

**10. What are the benefits of being in this study?**

There may or may not be any benefits to you. Information obtained from this study will help to provide valuable insights into the level of knowledge and attitudes of undergraduate nursing students to improve the nursing students' clinical competence in preventing pressure ulcers. This opportunity allows nursing students to reflect on their current practices and attitudes, fostering a proactive approach to patient care. Additionally, your involvement contributes valuable data to research that can inform improvements in nursing education and curriculum development. Furthermore, engaging in the study could provide networking opportunities with peers and mentors, enriching your academic and professional growth while reinforcing your commitment to patient safety and quality care. However, it is important to note that feedback on study findings will not be provided at the end of the study.

**11. Who is funding the research?**

This study does not receive any external funding. You will not be paid for participating in this study.

**12. Will my medical information be kept private?**

All your information obtained in this study will be kept and handled in a confidential manner, in accordance with applicable laws and/or regulations. When publishing or presenting the study results, your identity will not be revealed without your expressed consent. Individuals involved in this study, qualified monitors and auditors, and governmental or regulatory authorities may inspect the study data, where appropriate and necessary.

**13. Who should I call if I have questions?**

If you have any questions about the study or if you think you have a study related injury and you want information about this study, please contact the main researcher, Schavera Elyiot Junik at telephone number: 016-4722550 or the supervisor of this study, Mr. MD Fadlisham bin Samsuddin, who can reach through the email address: [smfadlisham@unimas.my](mailto:smfadlisham@unimas.my). If you have any questions about your rights as a participant in

this study, please contact: The Secretary, Medical Research & Ethics Committee, Ministry of Health Malaysia, at telephone number 03-3362 8407/8205/8888.

#### **14. Who can participate in this study?**

In this study targeting undergraduate nursing students, the inclusion and exclusion criteria have been meticulously defined to delineate eligible participants. Inclusion criteria comprise undergraduate nursing students from Year 1 to Year 4 and undergraduate nursing students who have attended or are currently attending the MDJ1704 Fundamental of Nursing course. Conversely, exclusion criteria are established to exclude individuals with potential confounding factors or conditions that might impact the study result outcome. This encompasses postgraduate nursing students, participants recruited for the pilot study, and participants who are hesitant or decline to consent to participate. These criteria collectively aim to create a homogeneous participant group, ensuring the study's precision, validity, and relevance to the targeted research objectives.

## INFORMED CONSENT FORM

### **Title of Study: Knowledge and Attitude towards Pressure Ulcer Preventions Among UNIMAS Undergraduate Nursing Students: A Quantitative Study Design**

By signing below, I confirm the following:

- I have been given oral and written information for the above study and have read and understood the information given.
- I have had sufficient time to consider participation in the study and have had the opportunity to ask questions, and all my questions have been answered satisfactorily.
- I understand that my participation is voluntary, and I can at any time free withdraw from the study without giving a reason, and this will in no way affect my future treatment. I am not taking part in any other research study at this time. I understand the risks and benefits, and I freely give my informed consent to participate under the conditions stated. I understand that I must follow the study doctor's (investigator's) instructions related to my participation in the study.
- I understand that study staff, qualified monitors and auditors, the sponsor or its affiliates, and governmental or regulatory authorities have direct access to my medical record in order to make sure that the study is conducted correctly, and the data are recorded correctly. All personal details will be treated as STRICTLY CONFIDENTIAL.
- I will receive a copy of this subject information/informed consent form signed and dated to bring home.
- While information gained in this study, it may be used in a conference presentation and may also be published in journal articles, I will not be identified, and information concerning me will remain strictly confidential.
- I agree/disagree\* that my family doctor be informed of my participation in this study. (\*delete which is not applicable)

**Subject:**

**Signature:**

**I/C number:**

**Name:**

**Date:**

**Investigator conducting informed consent:**

**Signature :**



**I/C number: 020211-12-0528**

**Name: Schavera Elyiot Junik**

**Date**

## Appendix D: Questionnaire

### SECTION A: SOCIODEMOGRAPHIC DATA

Answer the questions below accordingly. Please complete the following information.  
Kindly choose or fill in the answer in the blanks provided.

Age: \_\_\_\_\_

Gender: ☐ Male ☐ Female

Race:

- ☐ Malay
- ☐ Chinese
- ☐ Indian
- ☐ Bumiputera Sarawak
- ☐ Bumiputera Sabah

Religion:

- ☐ Islam
- ☐ Christian
- ☐ Buddha
- ☐ Hindu
- ☐ Other: .....

Year of study

- ☐ Year 1
- ☐ Year 2
- ☐ Year 3
- ☐ Year 4

## SECTION B: PRESSURE INJURY PREVENTION KNOWLEDGE INSTRUMENT (PIPK)

López-Franco, M. D., Parra-Anguila, L., Comino-Sanz, I. M., & Pancorbo-Hidalgo, P. L. (2020).

There are several statements on the recommendations for the prevention of pressure injuries; some are correct, and some are incorrect practices. Please, read each statement carefully and tick (✓) the box T (true) or F (false). If you do not know the answer, tick (✓) “I don’t know”. Please, try not to leave any items blank.

| Questionnaire                                                                                                                                                             | True | False | I don’t know |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|--------------|
| 1. When repositioning patient in bed, use some device or fabric to reduce friction/shear forces and avoid dragging on the bed surface.                                    |      |       |              |
| 2. If dietary intake does not meet nutritional requirements, offer high-protein, high calorie supplements to adults who are at risk for pressure injuries.                |      |       |              |
| 3. When repositioning in bed, patients can be placed over reddened skin areas.                                                                                            |      |       |              |
| 4. Skin areas in contact with medical devices (such as masks or tubes) do not have a higher risk for developing pressure injuries.                                        |      |       |              |
| 5. Nurses should describe all pressure injuries using a standardized classification system.                                                                               |      |       |              |
| 6. A cotton and elastic bandage on the heels allow redistributing the pressure and preventing pressure injuries.                                                          |      |       |              |
| 7. In bedridden patients at risk of pressure injuries, a mattress with pressure relieving properties should be used instead of a standard mattress.                       |      |       |              |
| 8. Rubbing the skin with alcohol and massaging over bony prominences is useful to enhance capillary circulation.                                                          |      |       |              |
| 9. A comprehensive skin assessment (head to toe) of all patients admitted to a facility (hospital or nursing home) may be done within the first 48 hours after admission. |      |       |              |
| 10. Repositioning is not necessary in bedridden patients using a pressure-relief mattress.                                                                                |      |       |              |
| 11. The seat tilt should be adequate to reduce pressure and shear forces on the skin of at-risk patients while sitting.                                                   |      |       |              |
| 12. In at-risk bedridden patients, keep semi-incorporated with head elevated between 30° and 45°.                                                                         |      |       |              |
| 13. All risk assessments performed must be registered in the patient's medical record.                                                                                    |      |       |              |

|                                                                                                                                                                          |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| 14. Nutritional status should be assessed when the patient is admitted to a health facility or a major change in his/her health status happens.                          |  |  |  |
| 15. The length of the surgery is not a risk factor for the development of pressure injuries.                                                                             |  |  |  |
| 16. Use a donut-shaped device to relieve the pressure in at-risk patients with reduced mobility.                                                                         |  |  |  |
| 17. Examine the skin for signs of redness, areas of non-blanchable erythema, localized heat, induration, or skin breakdown in individuals at risk for pressure injuries. |  |  |  |
| 18. The amount of time an individual spends sitting still does not influence the development of pressure injuries.                                                       |  |  |  |
| 19. Systematically use a validated risk assessment scale (Braden, Norton or EMINA).                                                                                      |  |  |  |
| 20. In bedridden patients, monitor the skin in high-risk areas for pressure injuries (such as the heels, sacrum, occipital, nose, and hips).                             |  |  |  |

**SECTION C: ATTITUDES TOWARD PRESSURE ULCER PREVENTIONS  
INSTRUMENT (APuP)**

*Beeckman D., Defloor T., Demarre L., Van Hecke A., Vanderwee K. (2010)*

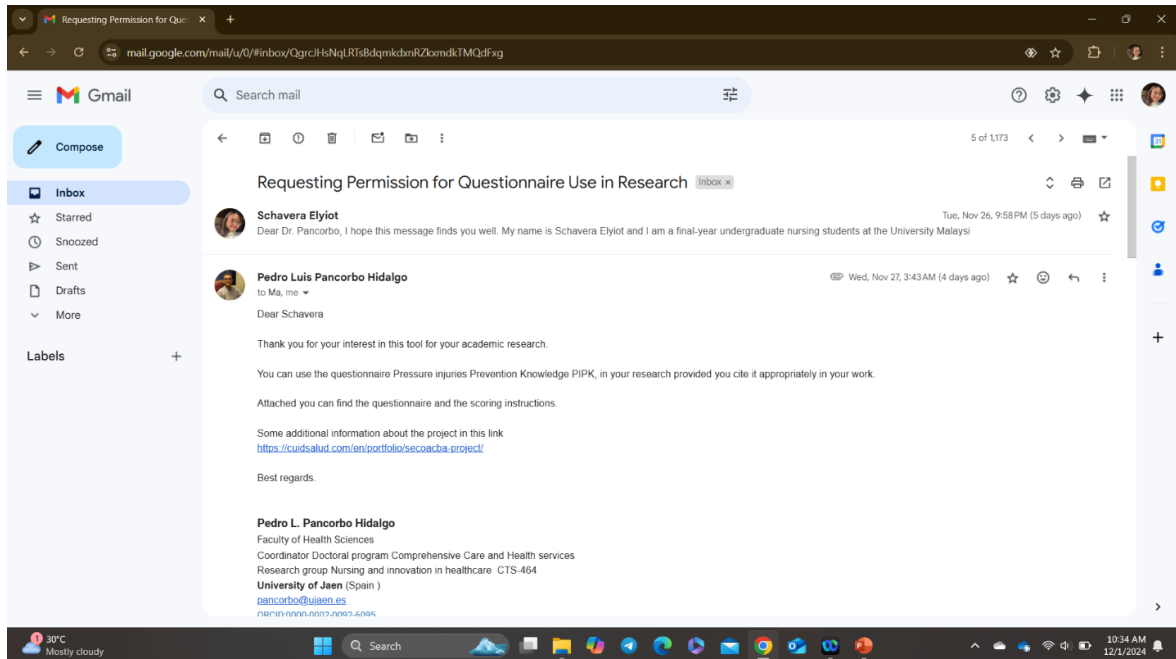
Please select the statement that best reflects your level of agreement or disagreement with each case.

Please be honest. There are no right or wrong answers. Tick (✓) the answers that suit you the most.

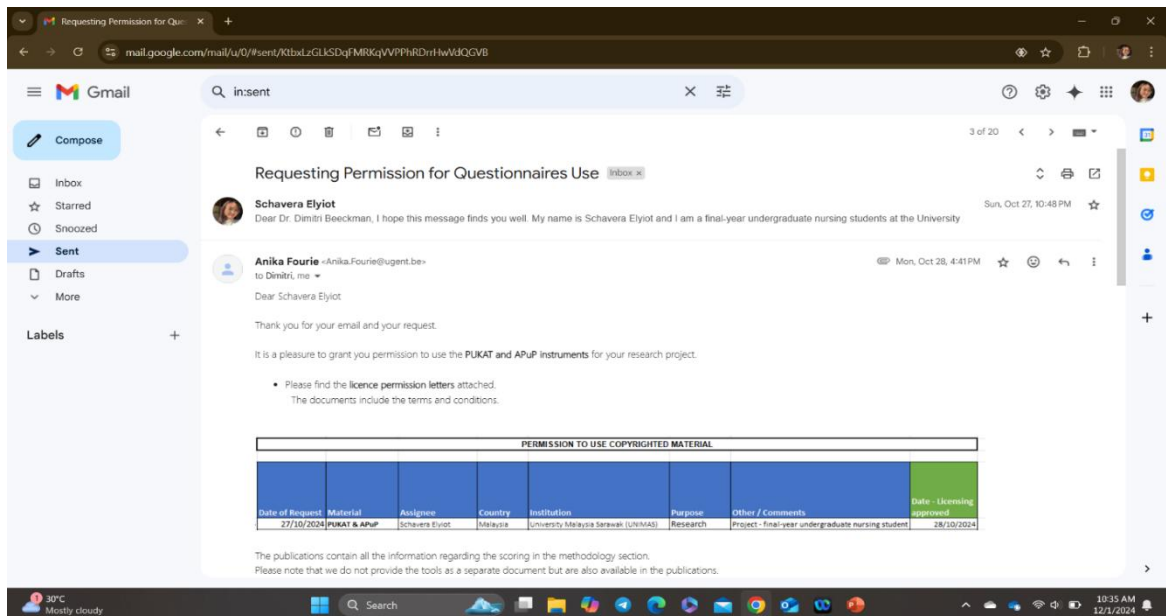
| Questionnaire                                                                      | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|------------------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| <b>Personal competency to prevent pressure ulcers</b>                              |                   |          |         |       |                |
| 1. I feel confident in my ability to prevent pressure ulcers.                      |                   |          |         |       |                |
| 2. I am well trained to prevent pressure ulcers.                                   |                   |          |         |       |                |
| 3. Pressure ulcer prevention is too difficult. Others are better than I am.        |                   |          |         |       |                |
| <b>Priority of pressure ulcer prevention</b>                                       |                   |          |         |       |                |
| 4. Too much attention goes to the prevention of pressure ulcers.                   |                   |          |         |       |                |
| 5. Pressure ulcer prevention is not that important.                                |                   |          |         |       |                |
| 6. Pressure ulcer prevention should be a priority.                                 |                   |          |         |       |                |
| <b>Impact of pressure ulcers</b>                                                   |                   |          |         |       |                |
| 7. A pressure ulcer almost never causes discomfort for a patient.                  |                   |          |         |       |                |
| 8. The financial impact of pressure ulcers on a patient should not be exaggerated. |                   |          |         |       |                |
| <b>Responsibility in pressure ulcer prevention</b>                                 |                   |          |         |       |                |
| 9. I am not responsible if a pressure ulcer develops in my patients.               |                   |          |         |       |                |
| 10. I have an important task in pressure ulcer prevention.                         |                   |          |         |       |                |
| <b>Confidence in the effectiveness of prevention</b>                               |                   |          |         |       |                |
| 11. Pressure ulcers are preventable in high-risk patients.                         |                   |          |         |       |                |
| 12. Pressure ulcers are almost never preventable.                                  |                   |          |         |       |                |

## Appendix E: Permission Obtained from Original Author to Use Questionnaire

### a. Pressure Ulcer Prevention Knowledge Instrument



### b. Attitude toward Pressure Ulcer Prevention Instrument



## Appendix F: Gantt Chart

| ACTIVITY                                      | MONTH |     |     |      |     |     |     |     |     |     |
|-----------------------------------------------|-------|-----|-----|------|-----|-----|-----|-----|-----|-----|
|                                               | 2024  |     |     | 2025 |     |     |     |     |     |     |
|                                               | OCT   | NOV | DEC | JAN  | FEB | MAR | APR | MAY | JUN | JUL |
| Determination of research title               |       |     |     |      |     |     |     |     |     |     |
| Literature review                             |       |     |     |      |     |     |     |     |     |     |
| Meeting with the supervisor                   |       |     |     |      |     |     |     |     |     |     |
| Submission of proposal defense slides         |       |     |     |      |     |     |     |     |     |     |
| Letter for Ethical approval                   |       |     |     |      |     |     |     |     |     |     |
| Submission of the first draft                 |       |     |     |      |     |     |     |     |     |     |
| <b>FYP 1: Submission of research proposal</b> |       |     |     |      |     |     |     |     |     |     |
| Data collection                               |       |     |     |      |     |     |     |     |     |     |
| Data analysis                                 |       |     |     |      |     |     |     |     |     |     |
| Writing up a report                           |       |     |     |      |     |     |     |     |     |     |
| Submission of the final draft                 |       |     |     |      |     |     |     |     |     |     |
| Poster presentation                           |       |     |     |      |     |     |     |     |     |     |
| Corrections                                   |       |     |     |      |     |     |     |     |     |     |
| <b>FYP 2: Submission of final project</b>     |       |     |     |      |     |     |     |     |     |     |

### Appendix G: Budget Allocation

| No | Item                                          | Quantity | Price per unit (RM)     | Budget (RM)          |
|----|-----------------------------------------------|----------|-------------------------|----------------------|
| 1  | Mobile data (DiGi)                            | 9 months | 35                      | 315                  |
| 2  | Printing for proposal defense presentations   | 2        | 0.50 per sheet (colour) | 0.50 x 28 pages = 14 |
| 3  | IBM SPSS Version 27 Software                  | 1        | 5                       | 5                    |
| 4  | Printing for poster presentation              | 1        | 40                      | 40                   |
| 5  | Printing and binding for final written report | 1        | 15                      | 15                   |
|    |                                               |          | Total budget            | 389                  |

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