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Awareness, Knowledge and Attitude Towards Basic Life Support (BLS) Among Undergraduate Nursing Students In UNIMAS

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This project is submitted

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DECLARATION

I hereby declare that this Final Year Project research entitle 'Awareness, Knowledge and Attitude Towards Basic Life Support (BLS) Among Undergraduate Nursing Students in UNIMAS' is an original work done by me and has been carried out in the Faculty of Medicine and Health Sciences (FHMS), University of Malaysia Sarawak (UNIMAS) under supervision during the period of October 2024 until June 2025. I certify that all citations and references used have been properly acknowledged in the text. I further declare this research study has not previously been submitted to any other university or institution.

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Signature

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ABSTRACT

Basic Life Support (BLS) involves life-saving procedures such as cardiopulmonary resuscitation (CPR), airway management, and the use of automated external defibrillators (AED). Despite its importance, studies show that gaps remain in the knowledge and practical competencies of nursing students, highlighting the need for effective and ongoing training. Given the high rates of cardiac-related deaths globally and in Malaysia, ensuring nursing students are well-prepared to perform BLS can significantly impact patient outcomes and survival rates. This study aimed to assess the level of awareness, knowledge and attitude toward BLS among undergraduate nursing students in UNIMAS, and to examine the relationship between these three factors. A descriptive, cross-sectional quantitative study was conducted among 163 undergraduate nursing students at University of Malaysia Sarawak (UNIMAS), selected through simple random sampling. Data were collected using 37-item self-administered questionnaire covering sociodemographic, BLS awareness knowledge, and attitude. The data collected were analyzed using IBM SPSS version 27. The findings showed that most students had high awareness (92.0%) and a positive attitude (68.1%) toward BLS, but their knowledge was relatively low (74.2%). There were significant correlations between awareness and knowledge ($r = .322$, $p < .001$), knowledge and attitude ($r = .260$, $p < .001$) and awareness and attitude ($r = .154$, $p = .049$). Although UNIMAS nursing students displayed good awareness and positive attitudes toward BLS, their knowledge was lacking. Incorporating simulation-based learning and regular refresher courses in the curriculum may help improve BLS knowledge and readiness.

Keywords: awareness, knowledge, attitude, basic life support (BLS), nursing students.

Kesedaran, Pengetahuan dan Sikap Terhadap Sokongan Hidup Asas (BLS) Dalam Kalangan Pelajar Kejururawatan Prasiswazah di UNIMAS

ABSTRAK

Sokongan Hidup Asas (BLS) melibatkan prosedur menyelamatkan nyawa seperti resusitasi kardiopulmonari (CPR), pengurusan saluran pernafasan, dan penggunaan defibrilator luaran automatik (AED). Walaupun ia sangat penting, kajian menunjukkan masih terdapat jurang dalam pengetahuan dan kecekapan praktikal dalam kalangan pelajar kejururawatan, sekali gus menekankan keperluan latihan yang berkesan dan berterusan. Memandangkan kadar kematian berkaitan jantung yang tinggi di peringkat global dan juga di Malaysia, memastikan pelajar kejururawatan bersedia untuk melaksanakan BLS dengan baik boleh memberi impak besar terhadap hasil rawatan dan kadar kelangsungan hidup pesakit. Kajian ini bertujuan untuk menilai tahap kesedaran, pengetahuan dan sikap terhadap BLS dalam kalangan pelajar kejururawatan prasiswazah di UNIMAS, serta meneliti hubungan antara ketiga-tiga faktor ini. Kajian kuantitatif secara keratan rentas deskriptif telah dijalankan melibatkan 163 pelajar kejururawatan prasiswazah di Universiti Malaysia Sarawak (UNIMAS) yang dipilih melalui pensampelan rawak mudah. Data dikumpul menggunakan soal selidik yang mengandungi 37 item yang merangkumi maklumat sosiodemografi, kesedaran terhadap BLS, pengetahuan dan sikap. Data yang dikumpul telah dianalisis menggunakan IBM SPSS versi 27. Dapatan menunjukkan bahawa majoriti pelajar mempunyai tahap kesedaran yang tinggi (92.0%) dan sikap yang positif (68.1%) terhadap BLS, namun pengetahuan mereka agak rendah (74.2%). Terdapat hubungan yang signifikan antara kesedaran dan pengetahuan ($r = .322$, $p < .001$),

pengetahuan dan sikap (r = .260, p < .001) serta kesedaran dan sikap (r = .154, p = .049). Walaupun pelajar kejururawatan UNIMAS menunjukkan tahap kesedaran yang baik dan sikap yang positif terhadap BLS, pengetahuan mereka masih kurang. Penggabungan pembelajaran berasaskan simulasi dan kursus ulang kaji secara berkala dalam kurikulum mungkin dapat membantu meningkatkan pengetahuan dan kesiapsiagaan terhadap BLS.

Kata kunci: *kesedaran, pengetahuan, sikap, sokongan hidup asas (BLS), pelajar kejururawatan.*

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LIST OF ABBREVIATIONS

AED	Automated External Defibrillator
AHA	American Heart Association
BLS	Basic Life Support
CPR	Cardiopulmonary Resuscitation
FMHS	Faculty of Medicine and Health Sciences
IHCA	In-Hospital Cardiac Arrest
IHD	Ischemic Heart Disease
IIUM	International Islamic University Malaysia
UNIMAS	University of Malaysia Sarawak
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

1.0 Introduction

This chapter provides an overview of the study, including its background, problem statement, research questions, objectives, significance, definitions of key terms, and a chapter summary. Section 1.1 outlines the study's background, followed by the problem statement in Section 1.2. The research questions are presented in Section 1.3, while Section 1.4 details the research objectives. The hypothesis and significance of the study is discussed in Section 1.5 and 1.6, definitions of key terms are provided in Section 1.7, and the chapter concludes with a summary in Section 1.8.

1.1 Background of Study

Basic Life Support (BLS) is a critical competency in emergency healthcare that focuses on maintaining life and preventing deterioration before advanced medical care becomes available (Shaheen et al., 2023). It involves skills like cardiopulmonary resuscitation (CPR), airway management and the use of automated external defibrillator (AED). For healthcare providers, especially nurses, BLS is not only a vital skill but also a professional responsibility as they are often the first point of contact in medical emergencies such as cardiac arrests or respiratory emergencies. Proper training ensures they can perform these interventions confidently and effectively. According to the American Heart Association (AHA), proper training and rapid BLS interventions rendered by trained personnel could positively impact patient survival rates in cardiac emergencies significantly (Merchant et al., 2020).

According to the World Health Organization (WHO), ischemic heart diseases (IHD) and strokes remain the leading causes of death worldwide, with IHD accounting for between 2.7 to 9.1 million deaths and strokes making up approximately 10% of global deaths in 2020 and 2021 (World Health Organization, 2024). IHD was also reported to be the leading cause of death in Malaysia, accounting for 17.0% of the 109,155 recorded deaths nationwide in 2020 (Department of Statistics Malaysia, 2021). The sentinel events of both IHD and strokes, including sudden cardiac arrests, often occur abruptly and without warning, even in individuals who appear to be healthy (Lott et al., 2021). These incidents typically take place outside of hospital settings, where there are no medically trained professionals available to provide life-saving CPR or use an AED. However, efforts are underway to increase public awareness and enhance CPR skills.

In hospitals, it is mandatory for healthcare personnel to be both knowledgeable and skilled in providing life-saving BLS to patients experiencing sudden cardiac arrests. This includes the ability to act as an individual rescuer who can perform high-quality CPR and effectively participate in a resuscitation team integrating AED use and airway management skills. High-quality CPR is vital in restoring circulation during cardiac arrest, significantly increasing the chances of survival when performed effectively and promptly (Elbaih & Alissa, 2020). AEDs are essential in recognizing and treating life-threatening arrhythmia, and their correct usage ensures timely defibrillation, a key determinant in patient outcomes during cardiac emergencies (Tsuda et al., 2019). Similarly, airway management skills ensure adequate oxygenation and ventilation, preventing further complications in patients with obstructed airways (Komasawa, 2024).

For nursing students, mastering these skills enhances confidence, improves decision-making during emergencies, and aligns with their role as primary responders in healthcare settings. It is crucial that nursing students also maintain a high level of awareness and a good attitude regarding BLS procedures, as both awareness and attitude serves as the foundation for timely and effective action during life-threatening events. Research indicates that while nursing education often provides students with foundational theoretical knowledge on BLS, practical skill gaps remain a challenge, emphasizing the need for comprehensive, simulation-based BLS training to prepare students for real-life scenarios (Rushton et al., 2020). Ensuring proficiency in these components not only meets professional standards but also directly contributes to reducing mortality and morbidity in critical situations.

1.2 Problem Statement

BLS involves basic intervention including, providing high-quality CPR, AED use, basic airway management, relief of choking and application of high-performance team dynamics before the arrival of resuscitation teams and during the administration of advanced cardiovascular life support measures (Jamaludin et al., 2018). Proficient BLS techniques, such as CPR and AED usage, can greatly enhance survival chances during sudden cardiac arrest and other related emergencies. However, research shows that despite the importance of BLS, there are widespread gaps in BLS knowledge and skills among nursing students worldwide (Salameh et al., 2018). These gaps can lead to delays or ineffective responses in emergency situations, impacting patient outcomes.

Gardiner et al. (2021) reported that the incidence of in-hospital cardiac arrest (IHCA) in the United States was 9.7 per 1,000 hospitalizations between 2008 and 2017. Among these cases, the survival rate in 2016 was only 25.8%. This highlights the critical need to enhance awareness and training in BLS skills, particularly CPR because according to Guetterman et al. (2019), nurses play three key roles in IHCA response: serving as the bedside first responders who encounter the IHCA, participating as members of the resuscitation team before physicians arrive, and acting as clinical or administrative leaders to provide care and facilitate hospital-wide initiatives. A study in Northwest Ethiopia found that hospital staff's knowledge and attitudes toward CPR improved after participating in at least one CPR training program (Abebe, 2021). Similarly, research among healthcare professionals in Saudi Arabia reported that the training group enhanced the knowledge and a positive shift in attitudes toward CPR (Abualfraj et al., 2022).

In the context of university students, a study from India found that about 61.9% of students attributed lack of awareness (Aroor et al., 2014). Meanwhile, research by Azlan et al. (2021) in Malaysia found that although medical students possessed higher awareness and positive attitudes towards BLS, a significant 42.8% merely had moderate knowledge and 55.4% had less than desirable knowledge regarding BLS. The study also revealed that 5.4% of the respondents expressed unfavorable attitudes towards BLS training (Azlan et al., 2021). Nursing students in particular need to be well-prepared and confident in applying BLS techniques, as they will soon be part of the country’s healthcare workforce (Azlan et al., 2021). At the Universiti of Malaysia Sarawak (UNIMAS), undergraduate nursing students undergo BLS training as part of their curriculum; however, there is limited research on their actual awareness,

knowledge and attitudes regarding BLS. Without a clear understanding of these aspects, it is challenging to evaluate the effectiveness of the current intervention and identify areas where improvements are needed.

This study seeks to address the critical need to assess the awareness, knowledge and attitudes of UNIMAS nursing students towards BLS. Understanding these factors will provide insight into the current gaps in BLS training, highlight the areas where nursing students may require additional support, and contribute to developing more effective training programs. Improving BLS competency among nursing students can ultimately enhance patient care and response during emergencies, ensuring that future nurses are fully equipped to perform life-saving interventions when needed.

1.3 Research Question

i. What is the level of awareness regarding BLS among undergraduate nursing students at UNIMAS?
ii. What is the level of knowledge regarding BLS among undergraduate nursing students at UNIMAS?
iii. What is the attitude of undergraduate nursing students at UNIMAS towards the BLS in clinical practice?
iv. Is there any relationship between awareness, knowledge and attitudes toward BLS among undergraduate nursing students at UNIMAS?

1.4 Research Objectives

General objective

To evaluate the awareness, knowledge, and attitudes of UNIMAS undergraduate nursing students toward BLS.

Specific objectives

i. To assess the level of awareness regarding BLS among undergraduate nursing students at UNIMAS.
ii. To assess the level of knowledge regarding BLS among undergraduate nursing students at UNIMAS.
iii. To identify the attitudes of UNIMAS undergraduate nursing students toward BLS.
iv. To examine the relationship between awareness, knowledge and attitudes toward BLS among undergraduate nursing students at UNIMAS.

1.5 Hypothesis

Null hypothesis: There is no significant association between awareness, knowledge, and attitudes toward BLS among undergraduate nursing students at UNIMAS.

Alternative hypothesis: A significant association exists between awareness, knowledge, and attitudes toward BLS among undergraduate nursing students at UNIMAS.

1.6 Significance of The Study

Online literature search revealed a scarcity of research specifically addressing awareness, knowledge, and attitudes toward BLS among nursing students in Malaysia, particularly within the local context of Sarawak and UNIMAS. To fill this gap, this study aims to comprehensively

assess these aspects to add new insights especially from local perspectives to enhance the existing evidence base.

The results of this study hold significant importance for nursing students, educators, and healthcare institutions. The findings from this study could reveal new insight and unique perspectives into knowledge gaps with regards to awareness, knowledge and attitudes of undergraduate nursing students towards BLS which could be used by related parties to revamp current educational interventions. A comprehensive and targeted training syllabus could enhance BLS knowledge and skill outcomes for nursing students which in turn translates to a more proficient and skillful future workforce (Kose et al., 2019).

The findings of this research can help shape health education policies at both institutional and national levels. Policymakers can use the data to support the integration of mandatory BLS training into nursing curricula across educational institutions or consider measures to improve the current interventions or framework.

1.7 Definition of Terms

Table 1.1

Conceptual and Operational Definition of Terms

Terms	Conceptual Definition	Operational Definition
Awareness	The state of being informed or conscious about something. It	In this study, participant's awareness towards BLS will be

	includes recognizing the presence or occurrence of events in your surroundings (Merriam-Webster, 2024).	measured using the questionnaire adopted from Aldhakhri & Can (2020). The questionnaire consists of 3 items measured using dichotomous scale with a total score range between 0 and 3.
Knowledge	Knowledge is the relationship between the conscious person and reality, usually through true statements. It involves not just holding beliefs but actively engaging with information in a thoughtful way to truly understand it (Zagzebski, 2017).	In this study, participant's knowledge towards BLS will be measured using the questionnaire adopted from Al-Mohaissen (2017). The questionnaire consists of 15 items measured using multiple-choice scale with a total score range between 0 to 15.
Attitude	Mental or emotional state of readiness, shaped by experience, that influences how a person responds to different objects or situations (Murphy, 2024)	In this study, participant's attitude towards BLS will be measured using the questionnaire adopted from Patidar and Sharma (2014). The questionnaire includes 13 items measured on a 5-point Likert scale (Strongly Disagree, Disagree, Uncertain, Agree, Strongly Agree),

	with a total possible score ranging from 0 to 13.
Undergraduate Nursing Students	Undergraduate nursing students in this study refers to students who are actively enrolled into the Bachelor of Nursing with Honours Degree Programme in the Faculty of Medicine and Health Sciences (FMHS), UNIMAS at the time of data collection.

1.8 Summary

This chapter provides an overview of the study's background, including an explanation of BLS, hypothesis, definition of terms and the significance of taking appropriate actions during real-life emergency situations. It also outlines the problem statement of the study, emphasizing the lack of research regarding nursing students in Malaysia concerning their awareness, knowledge and attitudes related to BLS. Additionally, this chapter discusses the objectives and significance of conducting this research. The subsequent chapter will focus on the literature review that was undertaken for this study.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

For the literature review, an electronic search was conducted across various databases, including PubMed and Google Scholar. The review focused on publications from 2014 to 2024. Keywords such as “awareness,” “knowledge,” “attitude,” “Basic Life Support (BLS),” “Cardiopulmonary Resuscitation (CPR),” “first aid,” “nurses,” and “nursing students” were utilized in the search. A total of 283 studies were initially identified. The results were narrowed down to include only free full-text articles in English. The abstracts were then reviewed for relevance, leading to the inclusion of 10 articles in the final analysis.

2.1 Awareness Towards BLS

BLS awareness is an essential aspect of emergency care preparedness for healthcare professionals. Research has repeatedly shown variability in awareness levels among nursing students. For instance, Azlan et al. (2021) implemented a quantitative cross-sectional study at the International Islamic University Malaysia (IIUM) involving 167 health science students from various faculties, including nursing (n = 68, 40.7%). Awareness levels were categorized as high (3–4 points) or low (1–2 points). The findings revealed that most of the participants, 50.9% (85 students) demonstrated a high level of BLS awareness. While most students in the study were familiar with BLS, a significant portion of 42% were unaware of the full meaning of the abbreviation “AED”. However, a significant majority (78.4%) were aware of the correct emergency contact number, both of which are essential in life-threatening situations. In emergency scenarios, a lack of clarity about medical terminology could hinder students' ability

to communicate effectively with colleagues, healthcare professionals, or bystanders, potentially leading to confusion and errors. These findings highlight the importance of health science students understanding technical terms (such as AED, CPR, etc.) to ensure accurate and efficient communication in clinical and emergency contexts.

This result aligns with a study by Ravi et al. (2024), which examined the knowledge, awareness, and attitudes of third-, fourth-, and fifth-year dental students at Manipal University College Malaysia regarding BLS. A total of 183 students from various academic years participated in the study. The researchers found that 104 students (56.8%) exhibited a high level of BLS awareness, with most participants (>77%) familiar with BLS, the full meaning of the abbreviation "AED", and the correct emergency contact number. However, 88.52% of participants were not aware of the most recent revision year for BLS guidelines. The authors attributed this gap to the possibility of outdated training materials and resources used in the curriculum, which may not incorporate the most recent updates. This highlights the importance of making current materials and guidelines available for teaching and learning to ensure that students are exposed to the most current guidelines to ensure optimum knowledge and performance based on the latest evidence recommendations.

The findings were further corroborated by a study conducted by Aroor et al. (2014), which involved 520 medical, dental, and nursing students from a tertiary care hospital in South India. The study revealed that 322 participants (61.9%) cited a lack of awareness towards BLS. Among the groups, medical students demonstrated the highest level of awareness regarding BLS (M = 4.61, SD = 1.50), compared to nursing students (M = 3.57, SD = 1.00). Additionally, 293 participants (56.3%) were aware of the emergency contact number, while only 59 (11.3%) could

correctly state the full term for the abbreviation “AED”. Although 496 students (95.4%) had previously heard of BLS, only 89 (17.1%) understood that BLS is not mandatory solely in hospital settings. This misconception likely stems from a misunderstanding of BLS's critical role in emergency scenarios. While many individuals are familiar with BLS, this awareness does not necessarily translate into a full understanding of its importance in hospitals, where timely application can profoundly influence patient outcomes.

The findings related to BLS awareness suggest that knowledge often remains superficial without ongoing education and practical training. While many students may be familiar with BLS or understand its general importance, their knowledge tends to be limited to theoretical concepts rather than practical skills. This surface-level awareness can lead to a lack of confidence and preparedness to perform BLS effectively during real-life emergencies. To overcome this, it is essential to incorporate thorough, hands-on training sessions and regular refreshers into the curriculum, ensuring that awareness evolves into actionable skills and a deeper understanding.

2.2 Knowledge of BLS

Knowledge involves understanding the theoretical components of BLS, such as the sequence of steps, chest compression techniques, ventilation ratios, and the use of AEDs. Research suggests that while nursing students often acquire this theoretical knowledge, they may struggle to retain it without adequate practical application (Hashemiparast et al., 2019). The teaching methods employed in nursing education can significantly impact students' level of knowledge about BLS. During clinical practice, nursing students are expected to apply what they have learned, performing high-quality CPR as taught by their educators. Nurses must be

prepared and confident to perform BLS during emergencies, rather than relying solely on doctors (Azlan et al., 2021). In a cross-sectional study done by Pelek et al. (2021) at a public university in Brazil, 191 undergraduate students from faculties such as physical education, pharmacy, medicine, dentistry, and nursing (n = 34, 97.1%) were assessed. Knowledge about BLS was categorized as high (≥70% correct answers) or low (<70% correct answers). The findings revealed that 30 participants (15.7%) demonstrated a high knowledge of BLS, with scores exceeding 70%. The highest levels of knowledge were observed among students in Medicine (46.2%) and Nursing (35.3%) programs, while participants from other courses displayed insufficient knowledge. The question most frequently answered correctly (74.3%) pertained to the airway-opening maneuver, followed by 69.1% accuracy on the use of AEDs. However, the highest proportion of incorrect answers (90.6%) related to the infant and child survival links in BLS. This could be attributed to the lack of emphasis on BLS for the child and infant age groups in the curriculum as compared to BLS for adults which would usually be addressed in general medical-surgical nursing courses. Exposure to BLS for children and infants may also sometimes be introduced to students in their more senior years during pediatric related courses which are commonly covered in later years of study.

Azlan et al. (2022) conducted research on the awareness, knowledge and attitudes of BLS among health sciences university students, revealing that most students had below-average knowledge of BLS. Specifically, 71.3% scored below average, while 28.7% achieved above-average knowledge. The majority of respondents correctly identified signs of sudden cardiac arrest (89.8%) and the pulse to check in an adult patient (79.6%). However, only 11.4% answered correctly regarding the compression depth for neonates during CPR and the absence of respiration. Additionally, a significant portion of respondents were unaware of how to

administer rescue breathing in infants (38.9%) and the appropriate compression depths for children (55.7%) and neonates (68.3%). Most participants also lacked knowledge about the chest compression-to-ventilation ratio for newborns (62.3%). This underscores the vital role of nursing education and educators in emphasizing the importance of BLS knowledge for children, including correct CPR techniques and choking management in infants, alongside adult-focused training.

Ravi et al. (2024) conducted a cross-sectional study involving 183 students, revealing that 54.10% (n = 99) had poor knowledge of BLS. Additionally, 80.87% of participants were unaware of the correct resuscitation sequence in BLS, and 78.69% did not know the normal breathing rate per minute. However, the majority (>60%) demonstrated knowledge of key aspects, such as locating the radial artery to check for a pulse, understanding emergency drugs and their administration routes, the correct chest compression depth for adults, the proper chest compression-to-rescue breath ratio, and performing abdominal thrusts for responsive choking individuals. Similarly, a study by Al-Mohaissen (2017) performed at a women's university in Saudi Arabia revealed that 87.9% of participants demonstrated very poor knowledge scores. Only 18.5% of students knew the correct rate of chest compressions for adults, and 21.1% knew the correct compression depth. This lack of BLS knowledge among nursing students may be attributed to its limited integration into the curriculum. In numerous nursing programs, BLS training is either not a fundamental part of the coursework or is covered briefly, with minimal practical sessions to solidify learning. This limited training significantly hampers students' proficiency in BLS skills.

Bajracharya and Nagarkoti (2016) conducted a study at a teaching hospital in Nepal involving 50 nurses. The findings revealed that nurses generally had low levels of BLS

knowledge, with 66% categorized as having poor knowledge, 32% as having moderate knowledge, and only 2% demonstrating adequate knowledge. Nurses' understanding of BLS was influenced by factors such as individual attributes, work experience, training programs, and prior CPR experience. Similarly, a study by Vidya et al. (2017) highlighted insufficient BLS knowledge among respondents, primarily due to a lack of prior BLS training or hands-on experience. While participants demonstrated average knowledge of individual BLS components, all agreed that BLS could be performed both within and outside hospital settings. This is because insufficient understanding of BLS can lead to the neglect of critical practices, with students lacking awareness of standard BLS training guidelines. Consequently, this knowledge gap impacts their attitudes and confidence in performing CPR, increasing the risk to bystanders and reducing patient survival rates before advanced medical care becomes available.

2.3 Attitudes Towards BLS

Attitude refers to a mental or emotional state of readiness, shaped by experience, that influences how an individual responds to different situations or objects (Murphy, 2024). The attitudes of nursing students can impact how they perceive BLS. A positive attitude toward BLS can significantly increase nursing students' willingness to perform life-saving interventions in emergency situations (Kassabry, 2023). A study conducted at Saudi Women's University found that 32.5% of students had never received any BLS training (Al-Mohaissen, 2017). Overall, attitudes toward BLS were positive, with most participants expressing a desire for more training (77.0%) and supporting mandatory BLS training (78.5%). Nursing students believed that BLS training should be offered in all workplaces, not just in health-related fields, and even across all colleges. However, 41.7% of students felt that high schools should be the first place to provide

BLS training. The study above highlighted a concerning statistic, revealing that almost one-third of students had never undergone BLS training, pointing to significant systemic and curricular shortcomings. A recurring recommendation across the studies was to introduce BLS training early, beginning in high school. This approach would help establish a solid foundation of life-saving skills while promoting a culture of confidence and readiness.

Students at IIUM displayed an overall positive attitude toward BLS training (Azlan et al., 2021). The majority of students (94.6%, n = 158) had a positive attitude, while only 5.4% (n = 9) expressed a negative attitude toward BLS training. Despite many students having received BLS training previously (54.5%), most reported wanting more training (92.8%). The primary reasons for wanting additional training were its importance for their future careers (61.7%), the desire to prevent unnecessary deaths in the community (25.7%), and a family history of heart disease (3.6%). Additionally, 56.3% of participants agreed that high schools should be the first place to offer BLS training, and 94% supported making BLS training mandatory in the curriculum. The study above highlighted a strong demand for more frequent and comprehensive BLS training, even among students who had previously received some form of BLS education. These gaps can be linked to an insufficient emphasis on BLS within nursing curricula, infrequent updates to training, and insufficient opportunities for practical application. Incorporating regular and up-to-date training into nursing education could mitigate skill decay and help students maintain their proficiency in BLS techniques.

A study by Fariduddin and Siau (2021) at University Technology MARA (UiTM), Selangor, also revealed a positive attitude towards BLS among student's teachers. The findings revealed that over half (59.5%) of respondents had not undergone formal CPR training. The

primary reason cited was a lack of information or resources to access CPR training (82%). Nevertheless, most respondents (98.2%) expressed a strong willingness to participate in formal CPR training as part of their teacher training program if the opportunity were available. Additionally, 83.8% of respondents had never been involved in handling or assisting in medical emergencies, which contributed to their reluctance to perform CPR without formal training (73.9%). However, this attitude shifted significantly (81.1%) once they indicated they would be willing to perform CPR if properly trained. Almost all respondents (94.6%) agreed that CPR training should be a mandatory component of teacher training programs in Malaysia. This highlights the importance of incorporating BLS training not only in nursing and medical programs but also in other fields. Individuals in non-medical professions are often bystanders during emergencies before professional assistance arrives at the scene. Providing them with BLS training expands the network of first responders within the community.

All the studies reviewed showed that students, regardless of their field of study, had a positive attitude toward CPR training, with the majority agreeing that CPR should be a mandatory part of the curriculum. A positive attitude boosts confidence and minimizes hesitation, allowing students to respond quickly and effectively in emergencies. Moreover, students with a positive attitude are more likely to actively participate in BLS training, retain the knowledge, and stay committed to maintaining their skills. This proactive mindset not only enhances their competence but also leads to improved patient outcomes in emergency care situations.

2.4 Relationships Between Awareness, Knowledge and Attitudes Towards BLS

A study by Kwiecień-Jaguś et al. (2020) demonstrated a relationship between the

examined variables. The Spearman correlation analysis revealed that respondents with higher BLS knowledge tended to have more advanced education ($r = 0.23$; $p < 0.001$). The study, however, identified no significant correlation between gender and knowledge levels among nursing students ($Z = 1.52$; $p > 0.05$). Furthermore, the Kruskal-Wallis non-parametric test indicated statistically significant associations between the variables ($H(2) = 38.97$; $p > 0.001$).

Azlan et al. (2021) investigated the association between sociodemographic factors and knowledge, attitude, and awareness of BLS using the Fisher Exact Test. The study found a significant association between age, course of study, and prior exposure to BLS training with knowledge levels on BLS ($p < 0.05$). Conversely no significant association was found between gender or year of study and knowledge levels. Additionally, prior exposure to BLS training was significantly associated with attitudes towards BLS training ($p < 0.05$), whereas age and gender showed no significant correlation. For awareness levels, significant associations were identified with age, course of study, and prior exposure to BLS training ($p < 0.05$), whereas gender and year of study were not significantly related.

Both studies highlight the crucial role of education and prior exposure to BLS training in shaping knowledge and attitudes. The positive correlation between advanced education and higher BLS knowledge ($r = 0.23$; $p < 0.001$) underscores the importance of structured, formal education in enhancing competency. Similarly, prior exposure to BLS training was identified as a significant factor influencing not only knowledge but also attitudes and awareness. These findings reinforce the need to incorporate BLS training as a standard part of educational curricula to ensure equitable and widespread access to essential life-saving skills. Notably, both studies found no significant link between gender and BLS knowledge or attitudes, challenging

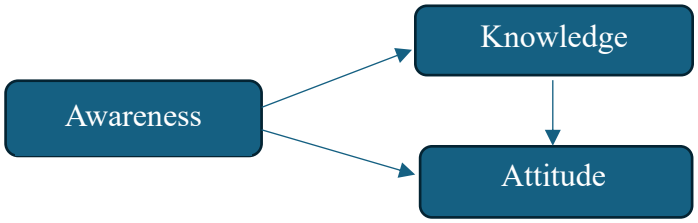
traditional assumptions about gender-based differences in learning. This suggests that well-designed and accessible training programs can be equally effective across genders. Furthermore, the absence of a relationship between year of study and knowledge levels in Azlan et al.'s research indicates that merely progressing through an academic program does not guarantee improved knowledge, highlighting the importance of targeted and regular BLS training throughout educational programs.

2.5 Conceptual Framework

The conceptual framework illustrates the correlation between awareness, knowledge, and attitude toward BLS and their combined effect on BLS preparedness and performance. Awareness serves as the foundation, helping individuals understand the significance of BLS and recognize opportunities for training and application. Knowledge builds upon awareness by providing the theoretical and practical skills needed to perform BLS effectively. Attitude acts as the motivational force, shaping an individual's confidence and willingness to respond in emergencies. These components are closely linked, with increased awareness driving the acquisition of knowledge and fostering a positive attitude toward BLS. A positive attitude, in turn, encourages the practical application of this knowledge. When these factors come together, they create a synergistic effect that strengthens readiness and proficiency in performing BLS. The framework underscores the importance of targeted efforts to enhance awareness, knowledge, and attitude collectively, which can greatly improve community preparedness and help prevent avoidable fatalities in emergency situations.

Figure 2.1

Conceptual Framework Map



2.6 Summary

In conclusion, understanding awareness, knowledge, and attitudes related to BLS is vital for developing effective implementation in healthcare settings. Examining the relationship between these factors is particularly important. The literature review revealed that while healthcare science students, including nursing students, generally demonstrate high awareness and positive attitudes toward BLS, their knowledge levels are often lacking. This highlights a gap between their mindset and their practical understanding and application of BLS protocols. To address this knowledge deficit, it is essential to implement improved educational programs, provide regular hands-on training, and incorporate simulation-based learning. Closing this gap will better prepare healthcare students, including nursing students, to perform BLS effectively, ultimately enhancing patient outcomes in emergency scenarios.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter provides a detailed overview of the research methodology, organized into specific subsections. Section 3.1 discusses the research design, followed by an explanation of the research setting in Section 3.2. Section 3.3 describes the research population, while Section 3.4 outlines the inclusion and exclusion criteria. The sampling method and sample size are covered in Section 3.5. Section 3.6 elaborates on the study instrument, and ethical considerations are addressed in Section 3.7. The pilot study is detailed in Section 3.8, with Section 3.9 focusing on the data collection procedure. Section 3.10 explains the data analysis process, and the chapter concludes with key insights in Section 3.11.

3.1 Research Design

The study utilized quantitative research design with a cross-sectional approach. Quantitative method incorporates statistical, mathematical, and computational methods to collect and systematically analyze measurable data. Techniques such as sampling, online questionnaires, polls, and surveys were used to gather information from current and potential participants (Mcleod, 2023). Cross-sectional study design are also utilized, which is commonly applied to evaluate attitudes and knowledge among healthcare professionals (Kesmodel, 2018). This design is particularly effective for collecting data from a large population at a single point

in time (Setia, 2016). Furthermore, it is both efficient and cost-effective, making it ideal for studies requiring rapid data collection (Simkus, 2023).

3.2 Research Setting

This study took place at UNIMAS, located on Jalan Datuk Mohammad Musa, 94300 Kota Samarahan, Sarawak, between March and April 2025. Among the university's 10 faculties, the FMHS has been selected for data collection. The study's target population comprises all undergraduate nursing students enrolled in the Bachelor of Nursing with Honours program, spanning Years 1 through 4. At the time of data collection, a total of 234 students were officially enrolled in this program. Data collection was conducted in the respondent's respective tutorial rooms during regular academic hours to encourage maximum participation. Approval from the faculty administration was sought, and ethical approval was granted by the UNIMAS Ethics and Research Committee. Printed structured questionnaires were distributed, and participants were provided with a quiet, private environment to complete them.

3.3 Research Population

The study population included students from the Bachelor of Nursing with Honours Programme FMHS, UNIMAS which consisted of students from year 1 to 4 of their study. The total undergraduate student population in FMHS, UNIMAS at the time of data collection was 234 undergraduate nursing students: 52 in Year 1, 63 in Year 2, 56 in Year 3, and 63 in Year 4.

3.4 Inclusion and Exclusion Criteria

Inclusion Criteria:

Undergraduate nursing students enrolled in the Bachelor of Nursing program at UNIMAS, from Year 1 to Year 4 were considered for participation in this study. Participants recruited on a fully voluntary basis.

Exclusion Criteria:

This study excluded postgraduate students, post-registration students, individuals who are unwilling or refused to provide consent, and nursing students who had participated in the pilot study.

3.5 Sampling Method and Sample Size

Sampling Method:

Simple random sampling was utilized to recruit participants for this study. This method is frequently used in quantitative research to ensure that all participants have an equal opportunity to be selected (Noor et al., 2022) and to minimize bias (Sharma, 2017). The sampling process involved six steps: population defining, a sampling frame selection, choosing a sampling method, the sample size determination, data collection, and analyzing the data (Taherdoost, 2016). For this study, a list of nursing students from Year 1 to Year 4 was obtained from the academic office of FMHS, UNIMAS. The student's particulars were organized by their matric numbers in a Microsoft Excel sheet where each student was assigned a unique serial number. To select participants from the list, the random formula function in Microsoft Excel was used to

randomly select participants to be recruited for the study. The researcher approached or contacted each of the randomly selected participants to be recruited as a respondent in the study.

Sample Size:

The sample size was calculated using Taro Yamane's (1973) simplified formula. The calculation steps are demonstrated as follows:

$$n = \frac{N}{1 + Ne^2}$$

n = sample size

N = population size

e = error (0.05) reliability level 95%

$$n = \frac{234}{1 + (234)(0.05)^2}$$

$$n = 148 \text{ participants}$$

Based on the calculations, the estimated sample size required for this study is 148 participants. However, to account for potential non-responses, dropouts, or incomplete data, an additional 10% was added to the total calculated sample in anticipation for any unforeseen attritions which brought the total sample required to 163 participants (Lakens, 2022). The calculation steps are detailed below:

Calculation of sample size with attrition rate:

148 × 10% = 15; therefore, 148 + 15 = 163 participants.

Pilot study:

163 × 10% = 16.3, rounded to 16 participants.

Actual study:

163 participants were selected from a pool of 218 participants (234 total sample size excluding 16 participants from the pilot study).

A final total of 163 participants was required for this study.

3.6 Research Instrument

This study utilized a structured, printed questionnaire distributed in English to undergraduate nursing students. The questionnaire was divided into four sections: Section A, Section B, Section C, and Section D (Appendix E).

3.6.1 Section A (Socio-demographic Data)

Section A consisted of 6-items to collect information about the participant's which includes gender, age, year of study, race, religion, and prior exposure to BLS training. Multiple-choice questions will be used for gender, year of study, race, religion, and previous exposure to BLS training, while the respondent's age requires filling in an open-ended question.

3.6.2 Section B (Awareness Towards BLS)

Section B consisted of 3-items assessing respondent's awareness of BLS adapted from Aldhakhri & Can (2020). The questions use dichotomous scales. 1-point will be awarded for correct or desired response while no points will be awarded for incorrect responses with a

possible score range of between 0 to 3. Total scores for this section will be categorized to indicate low awareness (0-1 points) or high awareness (2-3 points) accordingly.

3.6.3 Section C (Knowledge of BLS)

Section C contained 15 items designed to assess respondent's knowledge of BLS, adapted from a study by Al-Mohaissen (2016) conducted in Saudi Arabia. The questions are aligned with the most recent American Heart Association (AHA) BLS guidelines and use a multiple-choice option. 1-points will be given for each correct response, and zero points for incorrect responses, with a total possible score ranging from 0 to 15. Total scores for this section will be categorized to indicate low knowledge (0-10 points) or high knowledge (11-15 points) accordingly.

3.6.4 Section D (Attitudes Towards BLS)

Section D consisted of 13-items to assess respondent's attitudes toward BLS, adapted from a study by Patidar and Sharma (2014). The questions utilize a 5-point Likert scale with the response options: 1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, and 5 = Strongly Agree. Participants who selected strongly agree or agree were awarded 1-point, while all other responses received zero points with a possible score range of between 0 to 13. Respondents who obtained a total score of 10 or above (80% or above) for this section were deemed to possess positive attitudes while respondents who scored lower were deemed to possess negative attitudes.

3.7 Ethical Considerations

Prior ethical approval for the study was granted by the Research and Ethics Committee of the Faculty of Medicine and Health Sciences, UNIMAS before commencement of the data collection (Appendix A). Participants recruited for the study were provided with a participant information sheet which explained the study's purpose, objectives, procedures, participants' rights, and the researcher's contact details for further inquiries (Appendix C). Upon full disclosure, participants who chose to participate further in the study were asked to sign an informed consent form to confirm their voluntary participation (Appendix D). Participants were informed of their right to withdraw from the study at any time without any repercussions. Permission was also sought from the original authors of the instrument adopted for use in this study (Appendix F). All data collected in this study were used solely for this research and securely stored and accessible solely by the researcher and supervisors. To maintain participant's anonymity, participant's responses were entered and coded with all personal identifying particulars omitted to prevent data from being traced back to any specific individual respondent. The data files were securely stored in a password-protected private folder, accessible only to the researcher and supervisor. These files be kept for a period of two years after the study which will then be destroyed.

3.8 Pilot Study

A pilot study was carried out before the actual study to evaluate the validity and reliability of the questionnaire before the implementation for the actual study (Khanal & Chhetri, 2024). Participants for the pilot study were recruited using the same inclusion or exclusion criteria and sampling method as the actual study. The main objective of the pilot study

was to ensure the questionnaire's reliability before proceeding with the actual study. Conducting a pilot study is essential for improving the quality and efficiency of the primary study. As noted by Viechtbauer et al. (2015), the pilot study involved roughly 10% of the total calculated sample size. Participants and data collected from the pilot study were eventually excluded from the actual study. Cronbach's alpha was used to analyze data, measuring the reliability and consistency of the research instruments (Taber, 2017).

In this study, 10% of the total sample size was selected for participation in the pilot study. Thus, 16 nursing students meeting the inclusion criteria were recruited for the pilot study. The findings showed Cronbach's alpha values of 1.000 for awareness items, 0.736 for knowledge items, and 0.910 for attitude items, indicating that the questionnaire was reliable and appropriate for use in this research.

3.9 Data Collection Procedure

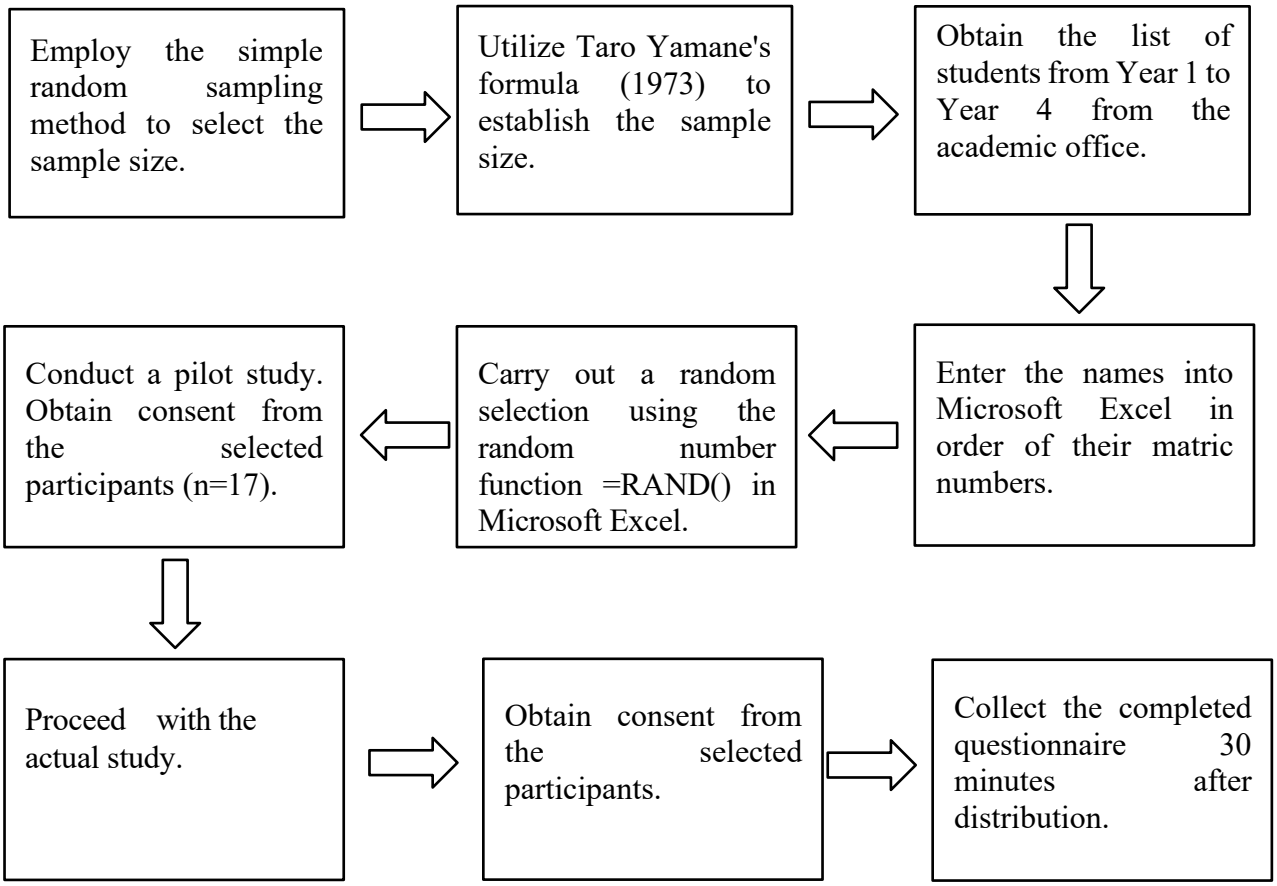
This study utilized a simple random sampling method to select participants from the target population. Inclusion and exclusion criteria were established to define the target population, consisted of UNIMAS undergraduate nursing students from Year 1 to Year 4. The sample size was determined as 163 participants using Taro Yamane's formula (1973). A list of nursing students from Year 1 to Year 4 sourced from the FMHS academic office at UNIMAS. The student’s particulars were organized by their matric numbers in a Microsoft Excel spreadsheet, with each student being assigned a unique serial number. Participants will then be randomly selected using the formula function =RAND() in Microsoft Excel. Participants who

were identified randomly were approached and invited personally by the researcher to participate in the study.

Prospective participants were provided with a participant information sheet which provided a full disclosure of the study purpose, objective, procedure, participant rights and the researcher's contact information. Participants were offered the opportunity to clarify any disparities regarding the studies with the researcher. Upon full disclosure, participants were required to sign an informed consent indicating their understanding and voluntary willingness to participate in the study before being provided with the printed questionnaire to complete. Data collection involved the use of a printed self-administered questionnaire, prepared in English. Participants were given 30 minutes to complete the questionnaire before the researcher collected back the completed responses. The figure below summarizes the data collection process, from the pilot study to the actual study.

Figure 3.1

Process of data collection



3.10 Data Analysis Method

The data collected in this study were analyzed using IBM Statistical Package for the Social Sciences (SPSS), version 27. Two analytical methods were employed: namely descriptive and inferential analyses.

Descriptive analysis is used to examine sociodemographic data, including gender, age, year of study, race, religion, previous exposure to BLS training, levels of awareness, knowledge, and attitudes towards BLS. The results are reported in frequencies, percentages, means, standard

deviations and interquartile ranges. To assess normality, the Kolmogorov-Smirnov test was applied, as the sample size exceeded 50 participants. (Mishra et al., 2019). Continuous data that are normally distributed are reported as means and standard deviations, while non-normally distributed data are presented as medians and interquartile ranges.

According to Mishra et al. (2019), parametric tests, such as the independent t-test (for comparisons between two groups) and ANOVA (for comparisons among three or more groups), were employed when the data were normally distributed. For data that did not meet normality assumptions, non-parametric tests were applied, including the Chi-square test, Mann–Whitney U test (for two groups), and Kruskal–Wallis H test (for three or more groups). Inferential statistics were also used to examine the correlations between awareness, knowledge, and attitudes towards BLS among undergraduate nursing students at UNIMAS. Pearson's correlation coefficient was used to assess relationships between variables with normally distributed numerical data, while Spearman's rho was applied to analyze associations involving non-normally distributed numerical data (Rovetta, 2020).

Table 3.1

Normality test for total awareness, knowledge and attitude scores of UNIMAS undergraduate nursing students

Items	Descriptive Statistics	Test of Normality (Sig.)	Interpretation
Total Awareness Score	Mean: 1.9816 5% of Trimmed Mean: 2.0000	< .001	Not normally distributed

Total Knowledge Score	Mean: 7.4049 5% of Trimmed Mean: 7.4284	.003	Not normally distributed
Total Attitude Score	Mean: 42.9448 5% of Trimmed Mean: 43.0215	< .001	Not normally distributed

3.11 Summary

In summary, this study employed a quantitative approach using a cross-sectional design conducted at the Faculty of Medicine and Health Sciences, UNIMAS. The study includes undergraduate nursing students from Year 1 to Year 4. Simple random sampling is utilized, with the sample size calculated using Taro Yamane's formula (1973), resulting in 163 participants. The study instrument consists of four sections, and a self-administered questionnaire distributed to the participants. Ethical approval was obtained prior to data collection. Finally, the collected data analyzed using IBM SPSS Statistics version 27, applying both descriptive and inferential statistical methods.

CHAPTER 4: RESULTS

4.0 Introduction

This chapter outlines the findings collected from 163 undergraduate nursing students at UNIMAS. The data are presented in alignment with the study's research objectives: to assess the level of awareness of BLS, evaluate knowledge about BLS, examine attitudes toward BLS, and explore the relationships between awareness, knowledge, and attitudes among the participants. Section 4.1 details the socio-demographic profile of the respondents. Section 4.2 reports on their level of awareness regarding BLS. Section 4.3 focuses on their knowledge of BLS, while Section 4.4 explores their attitudes toward BLS. Section 4.5 analyzes the relationships among awareness, knowledge, and attitudes toward BLS. Finally, Section 4.6 provides a summary of the chapter.

4.1 Socio-demographic characteristics of undergraduate nursing students in UNIMAS

A total of 163 undergraduate nursing students from UNIMAS participated in the study. Among them, 133 were female (81.6%) and 30 were male (18.4%) (see figure 4.1 below). The largest proportion of participants were 21 years old, making up 23.9% (n=39) of the sample, while the smallest group was those aged 25, representing only 0.6% (n=1). The average age of the participants was 21.80 years with a standard deviation (SD) of 1.392 (refer to table 4.1). No outliers or extreme values were detected in the data.

In terms of ethnicity, the majority of respondents were Malay (41.1%, n=67), followed by Sarawak Bumiputera (33.1%, n=54), Sabah Bumiputera (20.2%, n=33), Chinese (4.9%, n=8), and Indian (0.65, n=1). Regarding the religion, most of the participants identified as

Muslim (56.4%, *n*=92), followed by Christians (42.9%, *n*=70), with one Hindu participant (0.6%, n=1) and no Buddhists (0%, *n*=0). (see figure 4.2).

Participants were evenly distributed across academic years: Year 1, Year 2 and Year 3 each comprised 25.2% (*n*=41), while Year 4 students made up 24.5% (*n*=40). Out of 163 participants, 72.4% (*n*=118) had previously completed BLS training, whereas 27.6% (n=45) had not. (refer to table 4.1).

Figure 4.1

Frequency distribution of participants by gender and year of study (n=163)

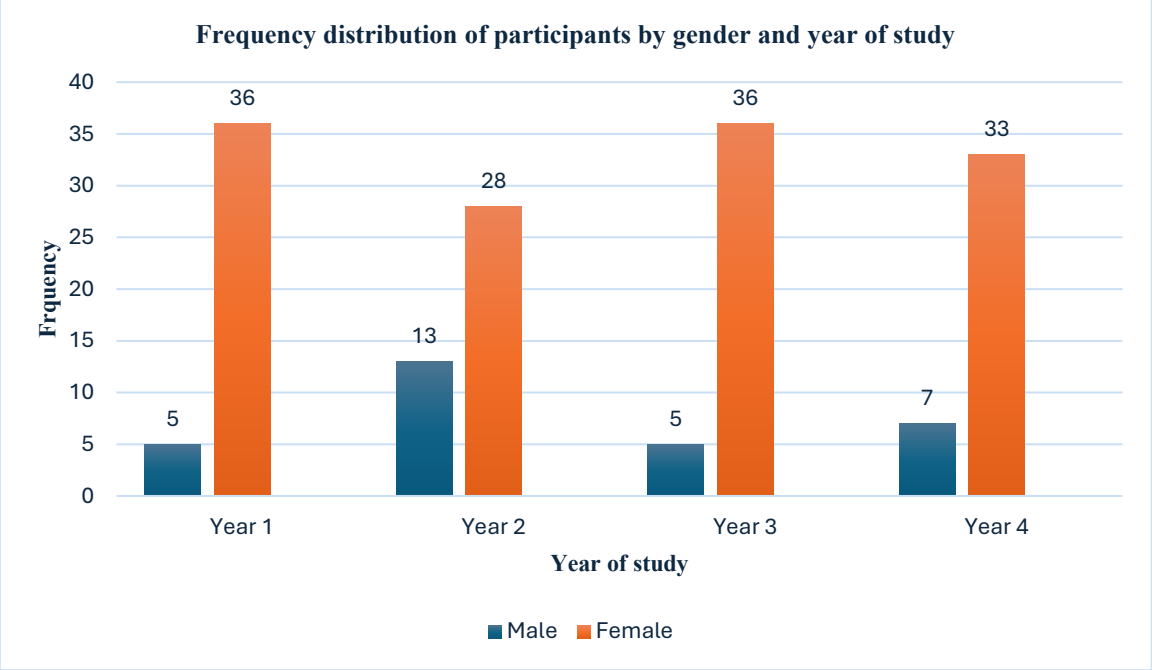


Figure 4.2

Percentage distribution of participants by race (n=163)

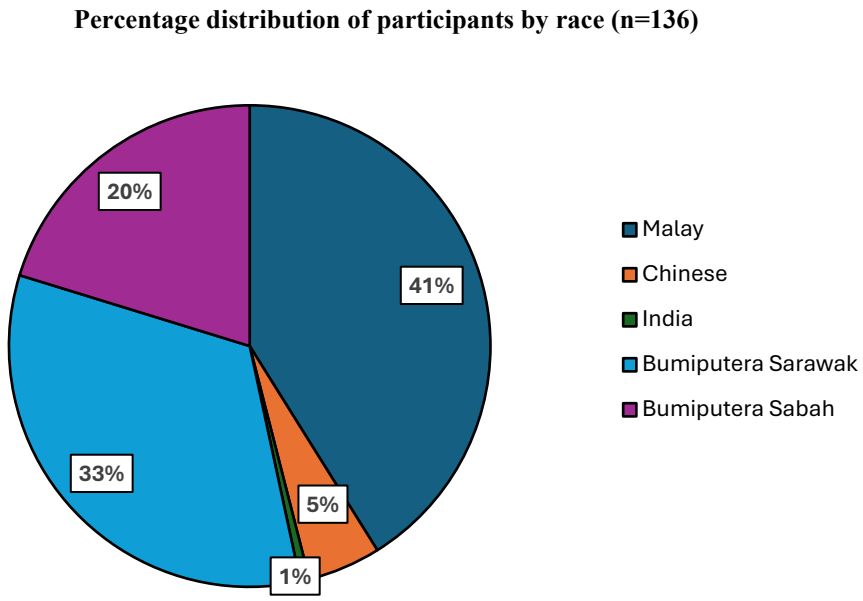


Table 4.1

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

Description	Frequency (*n*)	Percentage (%)	Mean ($\bar{x}$)	Std. Deviation (*SD*)
Age				
19 years old	2	1.2		
20 years old	32	19.6		
21 years old	39	23.9		
22 years old	35	21.5	21.80	1.392
23 years old	38	23.3		
24 years old	14	8.6		
25 years old	1	0.6		
26 years old	2	1.2		

Gender				
Male	30	18.4	0.82	0.389
Female	133	81.6		
Race				
Malay	67	41.1		
Chinese	8	4.9	2.87	1.683
India	1	0.6		
Bumiputera Sarawak	54	33.1		
Bumiputera Sabah	33	20.2		
Religion				
Islam	92	56.4		
Christian	70	42.9	1.44	0.510
Buddha	0	0		
Hindu	1	0.6		
Others	0	0		
Year of Study				
Year 1	41	25.2		
Year 2	41	25.2	2.49	1.119
Year 3	41	25.2		
Year 4	40	24.5		
Previously attended BLS training				
No	45	27.6	0.72	0.448
Yes	118	72.4		

Note: n: frequency, %: percentage, Mean ($\bar{x}$), Std. Deviation (SD)

4.2 The level of awareness on BLS among undergraduate nursing students at UNIMAS.

Table 4.2 displays the findings on the level of awareness regarding BLS among undergraduate nursing students at UNIMAS. Overall, the students demonstrated a high level of awareness. A significant majority (92%, *n*=150) were aware of CPR, although 19.6% (n=32) of them had not yet undergone formal CPR training. Conversely, 80.4% (n=131) reported having received CPR training. Only a small fraction (8.0%, n=13) was unaware of CPR. Notably, all respondents who had not received CPR training (100%, n=32) expressed an intention to attend such training in the future.

Table 4.2

Level of awareness on BLS among the undergraduate nursing students at UNIMAS (n=163)

	Awareness	*n* (%)	
		Yes	No
1.	Are you aware about CPR?	150 (92.0)	13 (8.0)
2.	Have you received any CPR training?	131 (80.4)	32 (19.6)
3.	If your reply is NO to question 2, do you intend to attend CPR training in the future?	32 (100)	0

Note: n: frequency, %: percentage

4.3 The level of knowledge on BLS among undergraduate nursing students at UNIMAS.

Table 4.3 presents the findings from a knowledge assessment survey on basic life support (BLS) and emergency response. The survey included 15 questions covering key areas such as scene safety and initial assessment, emergency response activation, CPR techniques for both adults and children, and appropriate responses to choking or collapse scenarios.

In the area of initial care, only 33.1% (*n*=54) of participants correctly identified the appropriate first step when encountering a collapsed individual, indicating limited knowledge. Slightly more (46.0%, *n*=75) knew how to assess a person's level of consciousness, while a larger majority (82.2%, *n*=134) correctly identified how to check for a pulse.

Regarding the emergency action sequence, only 42.3% (n=69) responded correctly when asked about the next step after confirming that someone is unresponsive, not breathing, and without a pulse. This suggests a moderate understanding of the sequence of life-saving steps. On a more positive note, the vast majority (88.3%, n=144) correctly knew the emergency number to call, reflecting strong awareness in that specific area.

In terms of CPR knowledge, 57.1% (n=93) correctly identified the chest compression site for adults, and 59.5% (n=97) knew the correct compression rate for both adults and children. A slightly higher percentage (68.7%, n=112) answered correctly about the appropriate compression depth for adults, and 69.3% (n=113) knew the correct compression-to-ventilation ratio for single-rescuer CPR in adults. However, when it came to pediatric CPR, knowledge was noticeably lower. Only 39.9% (n=65) correctly identified the proper depth of chest compressions for children and infants, and just 42.9% (n=70) knew the correct hand placement for infant

compressions. Furthermore, only 22.7% (n=37) knew how to correctly provide rescue breaths to an infant.

When evaluating knowledge of special emergency scenarios, understanding of how to respond to a drowning victim who is unresponsive but breathing was low, with just 25.2% (n=41) answering correctly. Knowledge was especially poor regarding adult choking responses, with only 3.7% (n=6) selecting the correct action. In contrast, a greater number (59.5%, n=97) were able to correctly identify the appropriate response to a choking infant.

Table 4.3

Level of knowledge on BLS among undergraduate nursing students in UNIMAS (n=163)

	Knowledge	*n* (%)	
		Correct	Wrong
1.	When you see a person collapsed on the road, which of the following would you do first? (Note: You are alone)	54 (33.1)	109 (66.9)
2.	How would you find out whether collapsed person was conscious?	75 (46.0)	88 (54.0)
3.	How would you find out if a collapsed person had a pulse?	134 (82.2)	29 (17.8)
4.	If You confirm that the collapsed person is unconscious, not breathing and has no pulse. What would you do next? (Note: You are alone)	69 (42.3)	94 (57.7)
5.	What number would you call for emergency medical services?	144 (88.3)	19 (11.7)
6.	What is the location for chest compressions for adults?	93 (57.1)	70 (42.9)
7.	What is the correct rate of chest compression for adults and children?	97 (59.5)	66 (40.5)

8.	What is the correct depth of chest compression for adults?	112 (68.7)	51 (31.3)
9.	What is the correct ratio of Cardio-Pulmonary-Resuscitation (Compression: Ventilation Ratio) for an adult when there is a single rescuer?	113 (69.3)	50 (30.7)
10.	What is the correct depth of chest compression for children and infants?	65 (39.9)	98 (60.1)
11.	What is the location for chest compressions in an infant?	70 (42.9)	93 (57.1)
12.	How do you give rescue breaths to infants?	37 (22.7)	126 (77.3)
13.	If you are witnessing an adult unresponsive victim who has been submerged in fresh water and just removed from it. He has spontaneous breathing, but he is unresponsive. What is the first step?	41 (25.2)	122 (74.8)
14.	If you and your friend are having meal and your friend suddenly starts expressing symptoms of choking, what should your first response be?	6 (3.7)	157 (96.3)
15.	If you witness an infant who suddenly starts to choke while playing with a toy. You have confirmed that he is unable to cry or cough. What should your first response be?	97 (59.5)	66 (40.5)

Note: n: frequency, %: percentage

4.4 Attitude on BLS among undergraduate nursing students at UNIMAS.

Table 4.4 summarizes the attitudes of respondents toward Basic Life Support (BLS), assessed using a 13-item questionnaire based on a five-point Likert scale from "Strongly Agree" to "Strongly Disagree." The analysis explores perspectives across three key areas: training and education, effectiveness and importance of BLS, and legal and ethical considerations.

In terms of training and education, a significant majority of respondents endorsed the idea that BLS training should be mandatory for all citizens, with 62.6% (n=102) strongly agreeing and 33.7% (n=55) agreeing. Likewise, integrating BLS into school curricula received strong support—63.8% (n=104) strongly agreed, and 33.7% (n=55) agreed. However, limiting mandatory BLS training only to professionals such as police, firefighters, and home guards was not widely supported. Only 19.6% (n=32) strongly agreed and 11.0% (n=18) agreed, while a large portion disagreed (44.2%, n=72) or strongly disagreed (11.7%, n=19), suggesting that respondents favor broader public access to training. Additionally, 55.2% (n=90) strongly agreed and 42.9% (n=70) agreed that the general public should be well-prepared to deliver BLS. Most also believed that training increases confidence in responding to emergencies, with 58.9% (n=96) strongly agreeing and 37.4% (n=61) agreeing.

In terms of the importance of BLS, the belief in the life-saving potential of BLS was nearly unanimous, with 68.7% (n=112) strongly agreeing and 30.7% (n=50) agreeing that timely BLS can save lives. Respondents also showed strong support for making Automated External Defibrillators (AEDs) publicly accessible: 52.1% (n=85) strongly agreed and 34.4% (n=56) agreed that this could reduce cardiac arrest fatalities. Similar levels of support were seen for the installation of AEDs in public places, with 62.0% (n=101) strongly agreeing and 28.8% (n=47)

agreeing. The idea that BLS should be provided even to strangers was well accepted, with 59.5% (n=97) strongly agreeing and 38.0% (n=62) agreeing. Furthermore, 63.2% (n=103) strongly agreed and 34.4% (n=56) agreed that a unified national EMS number is essential for emergency response.

In terms of legal and ethical considerations, nearly all respondents agreed that offering BLS is a moral obligation, with 47.2% (n=77) strongly agreeing and 43.6% (n=71) agreeing. However, concerns about potential legal repercussions were also apparent—25.2% (n=41) strongly agreed and 39.3% (n=64) agreed that fear of legal action could deter people from intervening, while 23.9% (n=39) were uncertain. Meanwhile, the idea that only healthcare professionals should perform BLS was largely rejected, with just 9.8% (n=16) strongly agreeing and 11.7% (n=19) agreeing. A much larger portion disagreed (45.4%, n=74) or strongly disagreed (20.9%, n=34), highlighting strong public support for widespread BLS competence beyond healthcare providers.

Table 4.4

Attitude on BLS among undergraduate nursing students at UNIMAS (n=163)

Attitude	*n* (%)				
	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
1. Basic Life Support training **should be mandatory** (voluntary) to every citizen of a country.	102 (62.6)	55 (33.7)	5 (3.1)	1 (0.6)	0
2. Basic Life Support can save one's life when administered timely.	112 (68.7)	50 (30.7)	1 (0.6)	0	0
3. Basic life support **should be** included in school curriculum.	104 (63.8)	55 (33.7)	2 (1.2)	1 (0.6)	1 (0.6)

4. Basic Life Support training **should only be made mandatory** to those handling casualties regularly such as the policemen, fire-workers, and home guards.	32 (19.6)	18 (11.0)	22 (13.5)	72 (44.2)	19 (11.7)
5. Basic life support training for the general public should be adequate to prepare them for providing basic life support.	90 (55.2)	70 (42.9)	3 (1.8)	0	0
6. BLS training increases an individual's confidence in providing basic life support.	96 (58.9)	61 (37.4)	6 (3.7)	0	0
7. Death due to cardiac arrests can be minimized if Automated External Defibrillator (AED) is made available in public places.	85 (52.1)	56 (34.4)	21 (12.9)	1 (0.6)	0
8. Automatic external defibrillators (AED) **should be** installed in public places.	101 (62.0)	47 (28.8)	13 (8.0)	1 (0.6)	1 (0.6)
9. Basic life support can be provided even to the strangers.	97 (59.5)	62 (38.0)	3 (1.8)	1 (0.6)	0
10. A country-wide emergency medical service (EMS) number is necessary to when responding to emergency situations.	103 (63.2)	56 (34.4)	4 (2.5)	0	0
11. Fear of legal actions can hinder you to perform basic life support.	41 (25.2)	64 (39.3)	39 (23.9)	17 (10.4)	2 (1.2)
12. Providing BLS to someone in need is a moral responsibility of every citizen of a country.	77 (47.2)	71 (43.6)	12 (7.4)	3 (1.8)	0
13. Only health professionals (eg., nurse, doctors) should provide BLS.	16 (9.8)	19 (11.7)	20 (12.3)	74 (45.4)	34 (20.9)

Note: n: frequency, %: percentage

4.5 The relationship between awareness, knowledge and attitude on BLS among undergraduate nursing students at UNIMAS.

The normality test revealed that the data did not follow a normal distribution (refer to Section 3.8, Table 3.1). Consequently, a non-parametric approach was used for the analysis. Spearman's correlation coefficient was applied to explore the relationship among awareness, knowledge, and attitude (see Table 4.5). Preliminary analysis, based on Table 4.5, confirmed a violation of the normality assumption. Although outliers were present for awareness scores, no extreme values were identified in the box plot. According to Schober et al. (2018), correlation strength can be interpreted as follows: r = 0.01–0.19 indicates no or negligible relationship, 0.20–0.29 represents a weak relationship, 0.30–0.39 denotes a moderate relationship, 0.40–0.69 indicates a strong relationship, and $r > 0.69$ suggests a very strong relationship.

The results showed a significant moderate correlation between awareness and knowledge, $rs(162) = .322$, $p < .001$, suggesting that greater knowledge ($Mdn = 7$) was associated with lower awareness ($Mdn = 2$). A weak but statistically significant correlation was found between knowledge and attitude, $rs(162) = .260$, $p < .001$, indicating that higher attitude scores ($Mdn = 44$) were linked to lower levels of knowledge ($Mdn = 7$). Additionally, a negligible yet significant correlation emerged between awareness and attitude, $rs(162) = .154$, $p < .001$, implying little meaningful association between higher attitude scores ($Mdn = 44$) and awareness ($Mdn = 2$).

Figure 4.3 presents the overall scores for awareness, knowledge, and attitude toward BLS among undergraduate nursing students at UNIMAS. Awareness was assessed through 3 items, knowledge through 15, and attitude through 13 items. The results showed that students

had high levels of awareness (92.0%), low knowledge (74.2%), and generally positive attitudes (68.1%).

Table 4.5

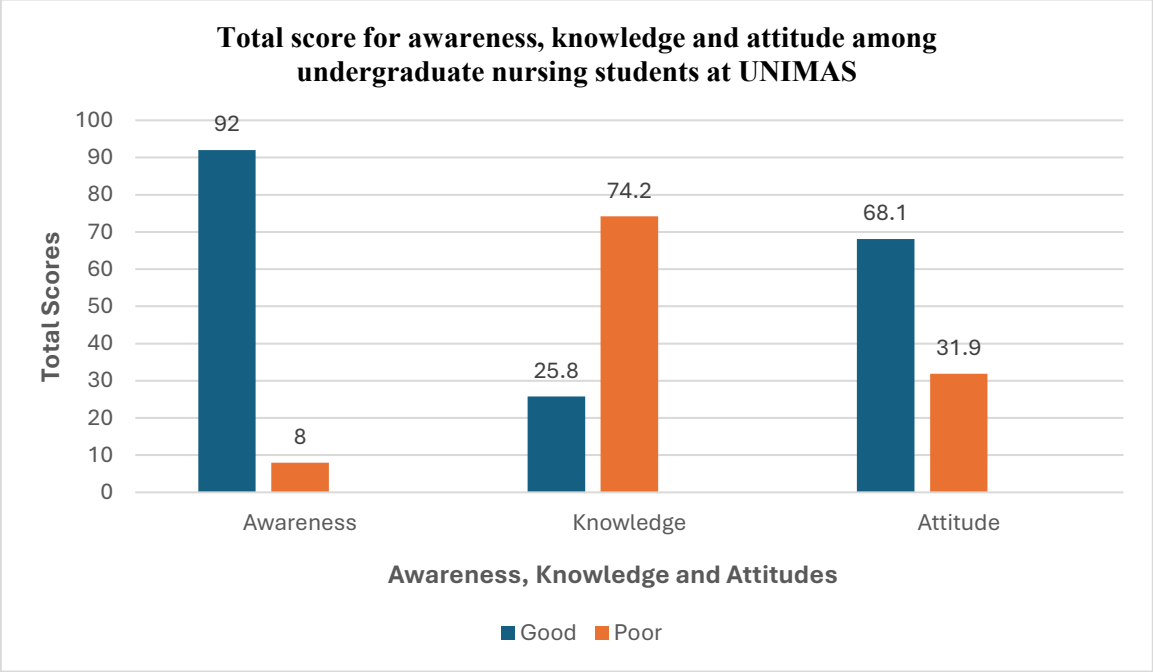
The relationship between awareness, knowledge and attitude on BLS among undergraduate nursing students at UNIMAS (n=163)

Correlations					
			Awareness	Knowledge	Attitude
Spearman's rho	Awareness	Correlation Coefficient	1.000	.322**	.154*
		Sig (2-tailed)		<.001	.049
		N	163	163	163
	Knowledge	Correlation Coefficient	.322**	1.000	.260**
		Sig (2-tailed)	<.001		<.001
		N	163	163	163
	Attitude	Correlation Coefficient	. 154*	.260**	1.000
		Sig (2-tailed)	.049	<.001	
		N	163	163	163

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

Figure 4.3

Total score for awareness, knowledge and attitude of BLS among undergraduate nursing students at UNIMAS



4.5.1 The association between gender with awareness, knowledge and attitude on BLS among the UNIMAS undergraduate nursing students

A Mann-Whitney U test was used to compare the awareness, knowledge, and attitude scores between male and female participants. Initial analysis showed a violation of the normality assumption, $D(163) = .099$, $p < .001$. While outliers were present for gender, the box plot showed no extreme values. The Mann-Whitney U test indicated no significant difference in the overall scores for awareness, knowledge, and attitude between males ($Mdn = 54.5$) and females ($Mdn = 53$), $U(162) = 1823.5$, $p = .462$.

Table 4.6

Mann-Whitney U test of total score for awareness, knowledge and attitude on BLS by gender among undergraduate nursing students at UNIMAS

Gender	n	%	Median	SD	U	Asymp. Sig (2-tailed)
Male	30	18.4	54.5	6.23	1823.5	.462
Female	133	81.6	53	6.25		

Note: n: frequency, %: percentage, SD: Standard Deviation

4.5.2 The association between year of study with awareness, knowledge and attitude on BLS among the UNIMAS undergraduate nursing students

A Kruskal-Wallis test was carried out to assess differences in the total scores for knowledge, attitude, and practice among students across four academic years. Preliminary analysis indicated a violation of the normality assumption, $D(163) = .099$, $p < .001$. The box plot showed no presence of outliers or extreme values. The test revealed a statistically significant difference in scores based on year of study, $H(3, 163) = 11.40$, $p = .014$ (see table 4.7). Students in Year 4 had a significantly higher median score ($Mdn = 55.5$) compared to those in Year 3 and Year 2 (both $Mdn = 53.0$), and Year 1 ($Mdn = 49.0$) (see table 4.8).

Table 4.7

Kruskal-Wallis H test for total score awareness, knowledge and attitude by four different years of study (n=163)

Total Score Awareness, Knowledge and Attitude

		df	Asymp. Sig
Kruskal-Wallis H	11.40	3	.014
N	163		

Table 4.8

Median for total score awareness, knowledge and attitude by four different years of study (n=163)

Total Score Awareness, Knowledge and Attitude						
Year	n	%	SD	Median	Minimum	Maximum
Year 1	41	25.2	6.59	49.0	35	61
Year 2	41	25.2	5.84	53.0	43	64
Year 3	41	25.2	6.45	53.0	41	63
Year 4	40	24.4	5.05	55.5	43	63

Note: n: frequency, %: percentage, SD: Standard Deviation

4.5.3 The association between previous attending to CPR training with awareness, knowledge and attitude on BLS among the UNIMAS undergraduate nursing students

A Mann-Whitney U test was performed to compare the total scores for awareness, knowledge, and attitude between respondents who had previously attended CPR training and those who had not. Preliminary analysis indicated a violation of the normality assumption, $D(163) = .099$, $p < .001$. No outliers or extreme values were detected from the box plot. The test revealed a significant difference in the total scores for awareness, knowledge, and attitude between those who had attended CPR training ($Mdn = 54$) and those who had not ($Mdn = 49$), $U(162) = 1718.5$, $p < .001$ (see table 4.9).

Table 4.9

Mann-Whitney U test of total score for awareness, knowledge and attitude on BLS by previously attending CPR training among undergraduate nursing students at UNIMAS (n=163)

Previous attended CPR training	n	%	Median	SD	U	Asymp. Sig (2-tailed)
No	45	27.6	49	6.33	1718.5	< .001
Yes	118	72.4	54	5.83		

4.6 Summary

In summary, the undergraduate nursing students at UNIMAS demonstrated generally high awareness, low knowledge, and a positive attitude toward Basic Life Support (BLS), with an overall score exceeding 67%. The data did not follow a normal distribution, so a non-parametric test, specifically the Spearman correlation coefficient, was used to examine the relationships between awareness, knowledge and attitude. The analysis revealed a weak correlation between knowledge and attitude, a moderate correlation between awareness and knowledge, and a negligible correlation between awareness and attitude. Furthermore, no significant differences were found in the total scores for awareness, knowledge, and attitude based on gender. However, significant differences were observed in these scores across years of study and whether or not students had previously attended CPR training.

CHAPTER 5: DISCUSSION

5.0 Introduction

This chapter discusses the findings on the level of knowledge, attitude and practice and the relationship between the level of knowledge, attitude and practice on hospital acquired infection (HAIs) prevention among the UNIMAS undergraduate nursing students. In this chapter, a summary of findings, implications, limitations of this study and conclusion will be presented.

5.1 The level of awareness toward BLS among undergraduate nursing students at UNIMAS

The study findings suggest that undergraduate nursing students in UNIMAS generally possess a strong awareness of BLS with a total score of 92.0%. A substantial majority (92.0%) reported being familiar with CPR, which is consistent with prior research suggesting that nursing students often have a foundational understanding of life-saving procedures due to their academic and clinical training (Dick-Smith et al., 2020; Lee & Kook, 2023). This high level of awareness reflects the effectiveness of nursing education programs in introducing critical emergency care principles early in students' academic progression.

However, despite the widespread awareness, it is important to note that 19.6% of students did not receive formal CPR training. This reveals a significant area for enhancement, as having theoretical knowledge without practical training may limit one's ability to respond effectively in real-life situations (De Araujo et al., 2022). The fact that 80.4% of students had received formal CPR training is consistent with findings from similar cohorts, where training

rates typically range between 70% and 90% (McAuliffe & Gledhill, 2022). Nevertheless, the fact that some students remain untrained reinforces the importance of embedding compulsory and recurring CPR training sessions into the nursing curriculum.

From the study, all students who lacked previous CPR training expressed a willingness to participate in future training. This proactive mindset is significant, as learner motivation plays a vital role in both the uptake and long-term retention of BLS skills (De Araujo et al., 2022). Institutions can take advantage of this eagerness by offering accessible and engaging training sessions, including simulation-based approaches, which have been found to improve confidence and long-term skill retention (Lee & Kook, 2023).

Only a small proportion (8.0%) of students were unaware of CPR, indicating that awareness campaigns and educational efforts have largely been effective. Even so, maintaining this level of awareness is critical, as studies have shown that BLS skills tend to decline within two years without regular practice (Kim et al., 2020). Therefore, implementing periodic refresher courses and competency assessments may help sustain high levels of preparedness among nursing students.

In conclusion, the findings suggest that UNIMAS nursing students exhibit high awareness and a generally high rate of CPR training, which bodes well for their readiness to handle cardiac emergencies. Bridging the gap in practical training and supporting students' enthusiasm for learning will further enhance their preparedness and contribute to better outcomes in clinical care.

5.2 The level of knowledge toward BLS among undergraduate nursing students at UNIMAS

The study presents evidence of varying levels of knowledge about BLS and emergency response among undergraduate nursing students at UNIMAS. With a total score of 74.2%, the majority of students exhibit a relatively low level of understanding related to BLS. The overall results indicate that while students demonstrate reasonable awareness in some areas, significant gaps remain, particularly in pediatric and special emergency scenarios.

In the initial care domain, only 33.1% of participants correctly identified the appropriate first step when encountering a collapsed individual. This low percentage reflects a concerning deficiency in fundamental emergency response knowledge, as the initial assessment is critical for effective intervention (Merchant et al., 2020). Similarly, less than half (46.0%) correctly assessed a person's level of consciousness, despite a larger majority (82.2%) knowing how to check for a pulse. These findings suggest that while some basic assessment skills are relatively well understood, foundational steps such as scene safety and initial evaluation require reinforcement. This aligns with prior studies indicating that nursing students often struggle with the early stages of emergency assessment (Maniago et al., 2020).

Regarding the emergency action sequence, only 42.3% correctly identified the next step after confirming unresponsiveness and absence of breathing and pulse. This limited understanding is worrisome, given the importance of timely CPR and activation of emergency services for improving survival outcomes (Kim et al., 2020). Encouragingly, 88.3% correctly knew the emergency number to call, demonstrating strong awareness of how to summon help, which is consistent with findings from other nursing cohorts (Hung et al., 2021). These findings

suggest that while most students are aware of how to call for help, many still lack a clear understanding of the correct steps to take during an emergency. This gap in knowledge could delay critical actions like CPR, which are essential for improving survival rates.

The knowledge of CPR techniques showed variability. Just over half of the students correctly identified the chest compression site (57.1%) and compression rate (59.5%) for adults and children, while slightly higher percentages understood compression depth (68.7%) and compression-to-ventilation ratio (69.3%) for adults. These results suggest moderate proficiency in adult CPR knowledge, which is somewhat consistent with previous research showing that nursing students often have better knowledge of adult CPR than paediatric CPR (Vural et al., 2017). Paediatric CPR knowledge was notably weaker: only 39.9% knew the correct compression depth for children and infants, 42.9% knew the appropriate hand placement for infant compressions, and a mere 22.7% understood how to provide rescue breaths to infants. The findings indicate that while nursing students demonstrate moderate knowledge of adult CPR techniques, their understanding of paediatric CPR is considerably weaker. This disparity suggests a need for more focused training on CPR for children and infants, as limited knowledge in these areas could hinder effective life-saving interventions in paediatric emergencies.

Special emergency scenarios revealed further knowledge deficits. Only 25.2% correctly responded to how to manage an unresponsive but breathing drowning victim, and adult choking response knowledge was particularly poor, with only 3.7% selecting the correct action. Conversely, a higher proportion (59.5%) correctly identified the response to a choking infant. These findings suggest that while students may be somewhat familiar with paediatric choking protocols, adult choking management and drowning emergencies are poorly

understood. This mirrors findings in other studies where special emergency scenarios are often underemphasized in training programs (Dick-Smith et al., 2020). This suggests that these topics are not well covered in current training and should be given more attention to better prepare students for real-life situations.

Overall, the data indicate that while UNIMAS nursing students possess basic awareness of BLS concepts, there are critical knowledge gaps, especially in paediatric care and special emergencies. This highlights the urgent need for comprehensive, practical, and recurrent BLS training that emphasizes both adult and paediatric protocols, as well as less commonly encountered but high-risk scenarios such as drowning and choking. Simulation-based training and scenario-based assessments have been shown to improve knowledge retention and confidence in managing diverse emergencies (Habibli et al., 2020; Kassabry, 2023). Incorporating these methods into nursing education could significantly enhance students' preparedness and ultimately improve patient outcomes.

5.3 Attitude toward BLS among undergraduate nursing students at UNIMAS

The findings from the study reveal a robustly positive attitude, reflected by an overall attitude score of 68.1% across three core areas: training and education, effectiveness and importance, and legal and ethical considerations. A strong consensus emerged around the importance of broad-based training and education, with the majority agreeing that BLS training should be mandatory for all citizens (96.3% combined agreement) and integrated into school curricula (97.5% combined agreement). This aligns with global recommendations emphasizing the societal benefit of early BLS intervention and the promotion of CPR education in schools

(Scapigliati et al., 2021). Notably, respondents rejected the notion that BLS training should be limited to professionals, with a combined 55.9% expressing disagreement or strong disagreement, underscoring a preference for universal access to life-saving skills. This aligns with the WHO's recommendations for community-based emergency response initiatives (Corbin et al., 2021). These findings emphasize the value of introducing BLS education early, such as in schools, to prepare students for emergency situations and breaking the stigma that BLS is only for healthcare professionals.

In terms of effectiveness and importance of BLS, nearly all respondents recognized the life-saving potential of timely BLS (99.4% combined agreement) and supported the public availability of AEDs, with 86.5% agreeing or strongly agreeing that this could reduce cardiac arrest fatalities. Such views are consistent with evidence that public access to AEDs significantly improves survival rates from out-of-hospital cardiac arrest (Zijlstra et al., 2017). The strong support for providing BLS to strangers (97.5% combined agreement) and the endorsement of a unified national EMS number (97.6% combined agreement) further demonstrate respondents' recognition of BLS as a vital component of emergency preparedness. This highlights the need to continue promoting public BLS training and access to emergency tools like AEDs.

Legal and ethical considerations elicited more nuanced responses. While most agreed that offering BLS is a moral obligation (90.8% combined agreement), a substantial proportion (64.5% combined) acknowledged that fear of legal repercussions could deter bystander intervention. This concern is well-documented in the literature and highlights the need for legal protections such as Good Samaritan laws to encourage public involvement in emergency situations (Uny et al., 2022). The strong rejection of the idea that only healthcare professionals

should perform BLS (66.3% combined disagreement or strong disagreement) further emphasizes respondents' positive attitude toward empowering the public with life-saving competencies.

Overall, the data indicates that respondents hold overwhelmingly positive attitudes toward BLS, with strong support for universal training, public access to AEDs, and the moral imperative to assist in emergencies, tempered only by concerns about legal risks. These findings underscore the importance of continued public education and policy measures to promote BLS competency and address barriers to bystander intervention.

5.4 The relationship between awareness, knowledge and attitude toward BLS among undergraduate nursing students at UNIMAS

The analysis revealed a moderate positive correlation between awareness and knowledge ($rs = .322$, $p < .001$), indicating that students with higher knowledge levels also tended to be more aware of BLS. This finding is consistent with prior research emphasizing the interconnectedness of cognitive understanding and perceptual awareness in emergency care education (Jamaludin, 2018). Notably, although the knowledge scores were relatively low (*Mdn* = 7), awareness scores were high (*Mdn* = 2; 92.0%), which may reflect a general familiarity with BLS terminology rather than comprehensive understanding. This highlights the need for targeted educational interventions that not only raise awareness but also enhance students' comprehensive knowledge and practical competency in BLS procedures.

A weak but statistically significant correlation was also found between knowledge and attitude ($rs = .260$, $p < .001$), suggesting that students with better knowledge of BLS were more

likely to exhibit positive attitudes. This supports the view that cognitive proficiency in BLS can enhance confidence and foster a proactive approach (Lee & Kook, 2023). Nevertheless, the weak correlation indicates that other variables such as personal experiences, motivation, or curricular focus may also play significant roles in shaping attitudes. These factors should be explored further to support a more comprehensive approach to BLS education.

Meanwhile, a negligible yet significant correlation between awareness and attitude (rs = .154, p = .049) was found. Although statistically significant, this relationship is too weak to imply any meaningful association, which may suggest that simply being aware of BLS does not necessarily translate into a favourable attitude. This discrepancy disconnect reinforces the idea that awareness campaigns alone may not be sufficient to cultivate behavioural readiness unless accompanied by practical knowledge and training (Schober et al., 2018).

Further analysis showed no significant difference in BLS-related scores between male and female students (U = 1823.5, p = .462), suggesting a consistent level of perception and educational experience regardless of gender. This finding is consistent with previous research that reported no notable gender differences in CPR knowledge or attitudes among nursing students (Aroor et al., 2014). However, the gender imbalance in the current sample, where females represented over 80% of participants may have limited the ability of the test to detect subtle gender-related differences, potentially affecting the statistical power of the analysis (George & Mallery, 2024). These results suggest that future research should strive for a more balanced gender representation to improve the validity and reliability of the findings.

In contrast, the year of study was significantly associated with overall BLS scores (H = 11.40, p = .014), with final-year students outperforming those in earlier academic years. This

outcome is expected, as senior students generally have greater clinical exposure and more opportunities to engage in practical training, leading to improved knowledge integration and more positive attitudes toward BLS (Azlan et al., 2021).

Moreover, previous participation in CPR training was found to significantly influence BLS scores ($U = 1718.5$, $p < .001$). Students who had received CPR training demonstrated better awareness, knowledge, and attitudes, underscoring the effectiveness of hands-on education in improving emergency preparedness (Aldhakhri, 2020). This highlights the critical need to integrate frequent and standardized CPR training sessions within the undergraduate curriculum.

Overall, while students demonstrated high awareness and positive attitudes toward BLS, their knowledge levels remained relatively low, highlighting a critical gap between perceived and actual competency. Targeted educational strategies, such as simulation-based learning and regular refresher courses, may help bridge this gap and enhance the effectiveness of BLS education in nursing programs.

5.5 Implications of the study

The study found that UNIMAS undergraduate nursing students demonstrated good levels of awareness and a positive attitude towards BLS, although their knowledge was relatively low. These results suggest that the existing curriculum is effective in promoting awareness and shaping positive attitudes. However, there is a need to enhance the BLS curriculum by incorporating more frequent theoretical instruction and practical training to support better knowledge retention among students.

5.5.1 Nursing Education

The study highlights the importance of strengthening BLS training within undergraduate nursing programs. Although students showed a generally high awareness and positive attitude, the weak to moderate correlations between awareness, knowledge, and attitude suggest gaps in their learning experience. Given that many students, particularly in pediatric BLS, showed limited knowledge, the nursing curriculum should place greater focus on pediatric BLS to better prepare students for diverse clinical situations (Binkhorst et al., 2018). Incorporating frequent BLS refresher sessions, hands-on simulations, and assessments throughout the academic curriculum can enhance knowledge retention and build confidence in performing BLS effectively. Previous research has shown that BLS knowledge can decline significantly within two years after training (Kim et al., 2020), highlighting the importance of ongoing reinforcement to ensure students are well-equipped to handle real-life emergencies.

5.5.2 Nursing Profession

For the nursing profession, the findings reinforce the need for continuous professional development in BLS competency. Nurses are often the first responders in clinical emergencies, and their ability to perform BLS effectively can be life-saving. Ensuring that nurses maintain up-to-date BLS skills through ongoing training and certification can improve the quality of patient care. Additionally, promoting a culture that values emergency preparedness within healthcare institutions can enhance nurses' responsiveness and confidence in critical situations (Habibli et al., 2020). The study supports efforts to embed BLS as a core professional competency throughout a nurse's career.

5.5.3 Future Research

The study opens avenues for further exploration into factors that influence BLS awareness, knowledge, and attitudes. Since the correlation between knowledge and attitude was found to be weak, future research should investigate other contributing elements such as self-confidence, previous exposure to emergencies, or institutional training support. Expanding the study to include students from different universities or healthcare programs may provide a more comprehensive understanding of BLS preparedness across disciplines. Additionally, longitudinal studies could examine the effectiveness of various teaching methods in retaining BLS competency over time (Kim et al., 2020).

5.6 Limitations of the study

The study had several limitations where the data collection for this study only focused on undergraduate nursing students in FMHS, UNIMAS. Therefore, it has limited generalizability and does not represent other healthcare educational institution and University in Malaysia. The use of a cross-sectional design also restricts the ability to determine causality between awareness, knowledge, and attitudes. Additionally, the data were collected through self-administered questionnaires, which may be subject to response bias, such as social desirability or inaccurate self-assessment.

5.7 Conclusions

The study found that although UNIMAS undergraduate nursing students showed high awareness (92.0%) and positive attitudes (68.1%) toward BLS, their actual knowledge levels were relatively low (74.2%). It also explored the relationships among awareness, knowledge,

and attitude, identifying significant correlations among all three. A moderate correlation between awareness and knowledge suggests that higher awareness is generally associated with better knowledge. However, the link between knowledge and attitude was weak, meaning that greater knowledge only slightly influences attitude. Additionally, the very weak correlation between awareness and attitude indicates that simply being aware of BLS does not necessarily result in a positive attitude. Overall, implementing focused educational approaches, such as simulation-based training and regular refresher sessions could help close this gap and improve the effectiveness of BLS education within nursing programs.

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APPENDICES

Appendix A: Ethical 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

MEMORANDUM

Reference : UNIMAS/NC-21.05/03-03 Jld. 8(134)

To : Aine Natasha Amiera Binti Ruslan (78690)
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: Awareness, Knowledge and Attitude Towards Basic Life Support (BLS) Among Undergraduate Nursing Students in UNIMAS**

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	:	**Aine Natasha Amiera Binti Ruslan**
Student ID	:	**78690**
Programme	:	**Bachelor of Nursing with Honours**
Research Title	:	***Awareness, Knowledge and Attitude Towards Basic Life Support (BLS) Among Undergraduate Nursing Students in UNIMAS***
Supervisor Name	:	**Mr Dev Nath Kaushal**
Supervisor H/P	:	**+60 10-525 7118**

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

Aine Natasha Amiera Binti Ruslan,

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. 15th 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: Aine Natasha Amiera Binti Ruslan

Matrix number: 78690

IC No.: 010121-12-0578

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: Awareness, Knowledge and Attitudes Towards Basic Life Support (BLS) Among Undergraduate Nursing Students at UNIMAS

Supervisor's name: Mr Dev Nath Kaushal

Email address: nkdev@unimas.my

Supervisor's HP number: 010-5257118

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

Thank you.

Yours sincerely,

(Aine Natasha Amiera Binti Ruslan)

Appendix C: Participant Information Sheet

PARTICIPANT INFORMATION SHEET

1. 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.

2. What is the purpose of the study?

The purpose of this study is to assess the awareness, knowledge, and attitudes of undergraduate nursing students at UNIMAS towards Basic Life Support (BLS). Through this evaluation, the study aims to identify strengths and gaps in their understanding and perceptions of BLS, which is an essential life-saving skill for healthcare professionals. The findings will help inform the development of more effective educational strategies and training programs to enhance the competency of nursing students, ensuring they are better prepared to respond to emergencies and contribute to improved patient outcomes.

This research will be conducted for a duration of 6 months (25/01/2025 till 30/06/2025). The expected number of participants is 163 individuals.

3. Who can participate in this study?

This study will comprise students from the Faculty of Medicine and Health Sciences, UNIMAS. The inclusion criteria will be undergraduate nursing students from Year 1 to Year 4 who enrolled at UNIMAS and willing to participate in the study. Exclusion criteria include students who had participated in the pilot study, not willing to participate in the study and post-registration nursing students.

4. What are my responsibilities when taking part in this study?

It is important that you answer all the questions asked by the study researcher honestly and completely, which will take about 10 minutes of your time.

You will be given a physical questionnaire to answer which will need to be returned upon completion. This form contains four (4) sections which will enquire about sociodemographic characteristics, the level of awareness, measuring knowledge of BLS, and identifying the attitudes towards BLS.

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

Participation in this study is entirely voluntary, and your decision to participate will not impact any future treatment you may receive. The risks associated with participating are minimal, primarily involving the time required to complete the study. You have the right to skip any questions that make you uncomfortable and may withdraw from the study at any time without facing any penalties.

6. 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 highlight the relationship between awareness, knowledge and attitude of Basic Life Support (BLS), specifically among nursing students.

Participating in this study provides benefits to undergraduate nursing students at UNIMAS by offering them the opportunity to enhance their understanding and skills related to BLS. By contributing to the research, students can gain insights into their own awareness, knowledge, and attitudes towards BLS, helping them identify areas for improvement. This study also enables students to contribute to the development of more effective training programs and educational strategies, ultimately preparing them better to handle emergency situations and improve patient care outcomes in their future professional roles.

7. Who is funding the research?

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

8. 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.

9. Who should I call if I have questions?

If you have any questions about the study or want information about this study, please contact the study researcher, Aine Natasha Amiera Binti Ruslan, at telephone number 011-33100687 or email ntshamera01@gmail.com.

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.

Appendix D: Informed Consent Form

INFORMED CONSENT FORM

Title of Study: Awareness, Knowledge and Attitude Towards Basic Life Support (BLS) Among Undergraduate Nursing Students in UNIMAS

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 freely 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 currently. 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 personal information 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.

Subject:

Signature: I/C number:

Name: Date:

Investigator conducting informed consent:

Signature: I/C number:

Name:	Date:
Impartial witness:	
Signature:	I/C number:
Name:	Date:

Appendix E: Research Instrument

Instruction: Please tick (√) or circle the answer choices below. You only need to give **ONE** answer only.

Section A. Demographic Information:

1. **Please state your age: _____**

2. **Please state your gender:**
   - Male
   - Female

3. **Please state your race:**
   - Malay
   - Chinese
   - India
   - Bumiputera Sarawak
   - Bumiputera Sabah

4. **Please state your religion:**
   - Islam
   - Christian
   - Hindu
   - Buddhist
   - Others: _____

5. **Please state your year of study:**
   - Year 1
   - Year 2
   - Year 3
   - Year 4

6. **Have you previously attended any Basic Life Support (BLS) training?**
   - Yes
   - No

Section B. Basic Life Support Awareness:

1. Are you aware about cardio-pulmonary Resuscitation (CPR)?

- Yes , I am aware
- No, I'm not aware

2. Have you received any cardio-pulmonary Resuscitation (CPR) training?

- Yes
- No

3. If your reply is NO to question #2, do you intend to attend CPR training in the future?

- Yes
- No

Part 3. Basic Life Support (BSL) Knowledge:

Instructions: read the following questions related to Basic Life Support. Choose the best option by encircling the letter of the correct answer.

1. When you see a person collapsed on the road, which of the following would you do fi (Note: You are alone)

a. Check if he is conscious, breathing and has a pulse

b. Push hard and fast in the center of the chest/start Cardio-Pulmonary-Resuscitation

c. Look for safety

d. Call your emergency response number

e. Don't know

2. How would you find out whether collapsed person was conscious?

a. Check their pupils

b. Ask him his name

c. Shake him and shout at him

d. Throw water on his face

e. Don't know

3. How would you find out if a collapsed person had a pulse?

a. Feel the pulse of his wrist (radial pulse)

b. listen to his heartbeat by putting my ears on his chest

c. feel the pulse of his neck (carotid pulse)
d. Look in his mouth
e. Don't know

4. If You confirm that the collapsed person is unconscious, not breathing and has no pulse. What would you do next? (Note: You are alone)
a. Roll the person on their side (recovery position)
b. Activate Emergency Medical Service.
c. Push hard and fast in the center of the chest/start CPR
d. Observe
e. Don't know

5. What number would you call for emergency medical services?
a. 990
b. 991
c. 999
d. 998
e. Don't know

6. What is the location for chest compressions for adults?
a. Left side of the chest
b. Right side of the chest
c. Mid chest
d. Xiphisternum
e. Don't know

7. What is the correct rate of chest compression for adults and children?
a. 60-80 compression/min
b. 80-100 compression /min
c. 100-120 compression /min
d. 120-140 compression /min
e. Don't know

8. What is the correct depth of chest compression for adults?
a. 5-6cm
b. 3-4 cm
c. 2-3 cm
d. 7-8 cm
e. Don't know

9. What is the correct ratio of Cardio-Pulmonary-Resuscitation (Compression: Ventilation Ratio) for an adult when there is a single rescuer?

a. 15:2
b. 30:2
c. 5:1
d. 15:1
e.Don't know

10. What is the correct depth of chest compression for children and infants?

a. 1½-2 cm
b. 2 ½-3 cm
c. At least one-third depth of chest
d. At least two thirds depth of chest
e. Don't know

11. What is the location for chest compressions in an infant?

a. One finger breadth below the nipple line
b. One finger breadth above the nipple line
c. At the intermammary line
d. At Xiphisternum
e. Don't know

12. How do you give rescue breaths to infants?

a. Mouth-to-mouth with nose pinched
b. Mouth-to-mouth and nose
c. Mouth-to-nose only
d. Mouth-to-mouth without nose pinched
e. Don't know

13. If you are witnessing an adult unresponsive victim who has been submerged in fr and just removed from it. He has spontaneous breathing, but he is unresponsive. What i step?

a. Start Cardio Pulmonary Resuscitation (CPR)for 2minutes and inform EMS
b. Start Cardio Pulmonary Resuscitation(CPR) for 1minute and inform EMS
c. Compress the abdomen to remove the water
d. Keep him in recovery position
e. Don't know

14. If you and your friend are having meal and your friend suddenly starts expressing symptoms of choking, what should your first response be?

a. Give abdominal thrusts
b. Give chest compression
c. Confirm foreign body aspiration by talking to him
d. Give back blows
e. Don't know

15. If you witness an infant who suddenly starts to choke while playing with a toy. You have confirmed that he is unable to cry or cough. What should your first response be?

a. Start Cardio Pulmonary Resuscitation (CPR) immediately
b. Try to remove the suspected foreign body using a blind finger sweeping technique
c. Back blows and chest compression of five cycles each, then open the mouth and remove the foreign body only when it is seen
d. Give water to the infant
e. Don't know

Part 4. Attitude toward Basic Life Support Scale:

Instruction. Please indicate the extent to which you agree or disagree to the items below by ticking (√) the appropriate box.

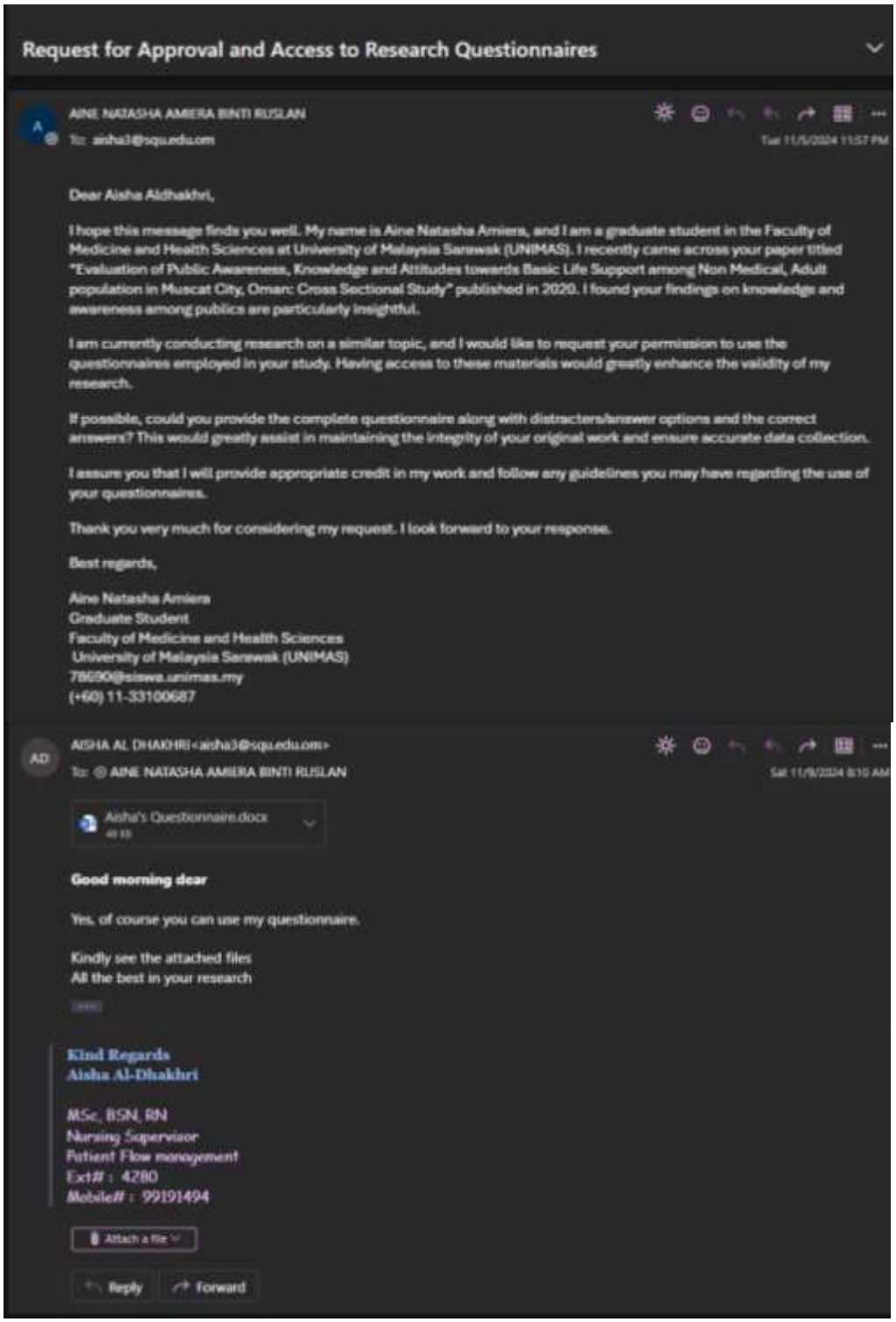
Items	Strongly Agree	Agree	Uncertain	Disagree	Strongly Agree
1. Basic Life Support training **should be mandatory** (voluntary) to every citizen of a country.					
2. Basic Life Support can save one's life when administered timely.					
3. Basic life support **should be** included in school curriculum.					
4. Basic Life Support training **should only be made mandatory**					

	to those handling casualties regularly such as the policemen, fire-workers, and home guards.						
5.	Basic life support training for the general public should be adequate to prepare them for providing basic life support.						
6.	BLS training increases an individual's confidence in providing basic life support.						
7.	Death due to cardiac arrests can be minimized if Automated External Defibrillator (AED) is made available in public places.						
8.	Automatic external defibrillators (AED) **should be** installed in public places.						
9.	Basic life support can be provided even to the strangers.						
10.	A country-wide emergency medical service (EMS) number is necessary to when responding to emergency situations.						
11.	Fear of legal actions can hinder you to perform basic life support.						
12.	Providing BLS to						

someone in need is a moral responsibility of every citizen of a country.					
13. Only health professionals (eg., nurse, doctors) should provide BLS.					

<<END>>

Appendix F: Permission Obtained from Original Author to Use Questionnaire



Request for Approval and Access to Research Questionnaires

AINE NATASHA AMIERA BINTI RUSLAN
To: aisha3@squ.edu.om
Tue 11/5/2024 11:57 PM

Dear Aisha Aldhakhri,

I hope this message finds you well. My name is Aine Natasha Amiera, and I am a graduate student in the Faculty of Medicine and Health Sciences at University of Malaysia Sarawak (UNIMAS). I recently came across your paper titled "Evaluation of Public Awareness, Knowledge and Attitudes towards Basic Life Support among Non Medical, Adult population in Muscat City, Oman: Cross Sectional Study" published in 2020. I found your findings on knowledge and awareness among publics are particularly insightful.

I am currently conducting research on a similar topic, and I would like to request your permission to use the questionnaires employed in your study. Having access to these materials would greatly enhance the validity of my research.

If possible, could you provide the complete questionnaire along with distracters/answer options and the correct answers? This would greatly assist in maintaining the integrity of your original work and ensure accurate data collection.

I assure you that I will provide appropriate credit in my work and follow any guidelines you may have regarding the use of your questionnaires.

Thank you very much for considering my request. I look forward to your response.

Best regards,

Aine Natasha Amiera
Graduate Student
Faculty of Medicine and Health Sciences
University of Malaysia Sarawak (UNIMAS)
78690@siswa.unimas.my
(+60) 11-33100687

AD
AISHA AL DHAKHRI<aisha3@squ.edu.om>
To: AINE NATASHA AMIERA BINTI RUSLAN
Sat 11/9/2024 8:10 AM

Aisha's Questionnaire.docx
40 KB

Good morning dear

Yes, of course you can use my questionnaire.

Kindly see the attached files
All the best in your research

Kind Regards
Aisha Al-Dhakhri

MSc, BSN, RN
Nursing Supervisor
Patient Flow management
Ext# : 4280
Mobile# : 99191494

Attach a file
Reply Forward

Appendix G: Gantt Chart

Activity	Year/Months								
	2024			2025					
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Research title determination									
Supervisor meeting									
Literature review									
Oral defense slides submission									
Ethical approval									
First draft submission									
FYP 1: Research submission									
Data collection									
Data analysis									
Report write-up									
Research Poster Presentation									
Final draft submission									
FYP 2: Final project submission									

Appendix H: Budget

Budget			
Project title	Awareness, Knowledge and Attitude Towards Basic Life Support (BLS) Among Undergraduate Nursing Students in UNIMAS		
Duration of the project	October 2024 – June 2025		
Items	Unit price (RM)	Quantity	Amount (RM)
Material and supplies			
Printing questionnaire form	0.10/page	6 pages	0.60
Photostatting questionnaire forms	0.06/page	978 pages	58.70
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