

**KNOWLEDGE AND PRACTICE ON FIRST AID OF
RICE (REST, ICE, COMPRESSION, ELEVATION)
METHOD AMONG UNDERGRADUATE NURSING
STUDENTS IN UNIVERSITI SAINS MALAYSIA**

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**BACHELOR IN NURSING
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by

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**Dissertation submitted in partial fulfilment of the
requirements
for the degree of
Bachelor in Nursing**

August 2025

DECLARATION

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



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LIST OF ABBREVIATIONS

USM	-	Universiti Sains Malaysia
FA	-	First Aid
RICE	-	Rice, Ice, Compression, Elevation
WHO	-	World Health Organization

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**PENGETAHUAN DAN AMALAN PERTOLONGAN CEMAS MENGGUNAKAN
KAEDAH RICE (REHAT, AIS, TEKANAN, TINGGIAN) DALAM KALANGAN
PELAJAR KEJURURAWATAN PRASISWAZAH DI UNIVERSITI SAINS
MALAYSIA**

ABSTRAK

Kecederaan muskuloskeletal seperti terseliuh dan ketegangan otot adalah perkara biasa dalam persekitaran klinikal dan komuniti. Kaedah RICE (Rehat, Ais, Tekanan, dan Tinggian) merupakan pendekatan pertolongan cemas yang sering disyorkan bagi menguruskan kecederaan ini dengan berkesan. Sebagai bakal penyedia penjagaan kesihatan, pelajar kejururawatan perlu memiliki pengetahuan dan kemahiran untuk mengaplikasikan kaedah ini dengan betul, sekali gus menekankan kepentingan pendidikan kejururawatan dalam pengurusan awal kecederaan. Kajian ini bertujuan untuk menilai tahap pengetahuan dan amalan berkaitan kaedah RICE dalam kalangan pelajar kejururawatan prasiswazah di Universiti Sains Malaysia (USM), serta meneliti hubungan antara pengetahuan, amalan, dan beberapa faktor sosio-demografi terpilih. Satu kajian keratan rentas telah dijalankan menggunakan soal selidik berstruktur, melibatkan seramai 190 orang pelajar. Data dianalisis menggunakan statistik deskriptif, korelasi Pearson, dan ujian Chi-Square melalui perisian Statistical Package for the Social Sciences (SPSS) versi 28.0. Majoriti peserta ($n = 118$, 62.1%) mempunyai pengetahuan yang mencukupi mengenai kaedah RICE, manakala 60.5% ($n = 115$) menunjukkan amalan yang baik. Terdapat korelasi positif yang signifikan antara pengetahuan dan amalan ($r^2 = 0.337$, $p = 0.01$). Dalam kalangan faktor sosio-demografi, hanya umur menunjukkan hubungan yang signifikan dengan tahap pengetahuan ($\chi^2 = 7.745$, $p = 0.021$), manakala jantina, tahap pendidikan, dan pendedahan terdahulu tidak menunjukkan hubungan yang signifikan.

**KNOWLEDGE AND PRACTICE ON FIRST AID OF RICE (REST, ICE,
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ABSTRACT

Musculoskeletal injuries, like sprains and strains, are common in both clinical and community settings. The RICE method (Rest, Ice, Compression, Elevation) is a widely used first aid approach to manage these injuries effectively. As future healthcare providers, nursing students need the knowledge and skills to use this method properly, emphasizing the importance of nursing education in early injury management. This study aimed to assess the level of knowledge and practice of the RICE method among undergraduate nursing students at Universiti Sains Malaysia (USM), and to explore the relationship between knowledge, practice, and selected socio-demographic factors. A cross-sectional study was carried out using a structured questionnaire, with 190 students taking part. Data were analysed using descriptive statistics, Pearson correlation, and Chi-Square tests with SPSS version 28.0. Most students ($n = 118$, 62.1%) had adequate knowledge of the RICE method, and 60.5% ($n = 115$) showed good practice. A significant positive correlation was found between knowledge and practice ($r^2 = 0.337$, $p = 0.01$). Among socio-demographic factors, only age showed a significant link with knowledge ($\chi^2 = 7.745$, $p = 0.021$), while gender, education level, and prior exposure did not show significant associations.

CHAPTER 1: INTRODUCTION

1.1 Introduction

This study was conducted to determine the level of knowledge and practice regarding the RICE (Rest, Ice, Compression, Elevation) method as a form of first aid among undergraduate nursing students at Universiti Sains Malaysia. The first chapter provided an overview of the study and the rationale for its implementation. It began with the background of the study, outlining the importance of knowledge and practice in administering first aid using the RICE method. This was followed by the problem statement, research questions, and hypotheses. Finally, the significance of the study and the operational definitions of key terms were presented.

1.2 Background of Study

Sport is a very useful physical activity and is closely related to human life. There is possibility of injury when carry out physical especially sports, whether in education, training, or fitness activities. This will significantly give an impact on disrupting physical, psychological and performance activities (Hidayatullah et al., 2024).

Injury can be defined as damage to the body which results in pain, heat, redness, swelling, and unable to function properly in ligaments, joints, or bones due to excessive movement activities or accidents. Injury is the main cause of death that often occurs in children and adolescents, especially at the age of 10 to 22 years and reaches 830,000 deaths annually in children and adolescents (Nurjayanti & Romadoni, 2023).

According to the World Health Organization (WHO), accidental injury is still the main cause of death and disability among adolescents in 2020. Approximately 72% of all deaths among adolescents with an age range of 10 years to 24 years of age are often injured due to 4 causes, namely motor vehicle accidents (30%), accidental injuries (15%),

homicide (15%), and suicide (12%). Then, more than 1 million sports-related serious injuries occur in schools every year among adolescents with an age range of 10 to 17 years. According to Ministry of Health (2018), sprains or ankle sprains are the type of injury that occurs as much as 36.1% (Nurjayanti & Romadoni, 2023).

Ankle sprain is a condition where there is excessive stretching or tearing of the ankle ligaments. Ligament injuries can occur due to sudden sprains during physical activity. An ankle sprain injury causes pain due to inflammation that increases due to weakness ligaments and muscle imbalance (Nurjayanti & Romadoni, 2023).

Several factors contribute to exercise-related injuries, some of which originate internally. A key reason is inadequate warm-up, which can lead to injury due to a lack of flexibility in the muscles and joints. External factors also play a role, such as the environment, insufficient facilities, and poor infrastructure. Additionally, overexertion is a significant cause of injury, often occurring when individuals neglect proper rest periods (Hidayatullah et al., 2024).

First Aid for injured victims is one of the basic types of knowledge that everyone should know. First aid for victims is one of the initial and temporary relief efforts carried out by the layman for victims, before receiving advanced assistance from medical personnel. Accuracy in providing first aid can minimize the occurrence of increasingly aggravating injuries (Purwacaraka et al., 2022).

The general guideline for treating injuries is to carry out RICE (Rest, Ice, Compression, and Elevation) (Hidayatullah et al., 2024). RICE method is a term that means 'R' for Rest by resting the injured body part. Then, 'I' is for Ice that include in giving ice compresses to the injured area and 'C' is Compression refer to application of compressive force to the location of the injury such as with a bandage, decker or kinesiio taping. Lastly, 'E' is for Elevation by raising the injured part to return blood from the

injured area to the heart. This method is usually reserved for acute injuries, particularly soft tissue injuries as well as strains, and bruises. The RICE therapy method is carried out as soon as possible after the injury occurs, which is between 48 and 72 hours after the injury occurs (Purwacaraka et al., 2022).

First aid training in educational institutions is crucial for equipping students with the skills and knowledge necessary to respond effectively in emergency situations. Nursing students are an important group to provide first aid care and basic life support (Pei et al., 2019).

First aid training has the potential to reduce morbidity and mortality from common injuries and illnesses, which represent a significant public health burden (Mersal & Aly, 2016). The importance of suitable training for nursing students to ensure that they are resilient and continue in the profession. However, higher education seems to be failing at introducing students to practice, which is a key point to the completion of nursing training (Ramírez-Torres et al., 2023).

As study showed that only less than half of nursing students under study had satisfactory scores of knowledge level regarding first aid measures. While, slightly more than half of them had satisfactory scores of practices and positive attitude toward first aid measures (Abd-Elsamea et al., 2018). In Malaysia, there is a lack of comprehensive studies assessing the knowledge and practice of the RICE method among Malaysian nursing students, indicating a wider gap within nursing education concerning this crucial first aid technique. The existing curriculum may provide only minimal focus on the practical application of RICE in the management of musculoskeletal injuries, resulting in uncertainty regarding nursing students' ability to apply the method confidently and accurately in emergency situations. This shortfall in educational emphasis has the

potential to affect the quality of early injury management and, consequently, patient care outcomes.

1.3 Problem Statement

Based on data from the United States and the United Kingdom, it was estimated that every year, 2 million cases of sprain and strain injuries were reported, and these were the leading causes of injuries and accidents. About 40% of sprains and strains occurred as a result of daily activities and exercise. The prevalence of sprains and strains was higher and was more frequently observed in individuals under the age of 24 (Mawarda & Nurjannah, 2024).

In Indonesia, the incidence of injuries within the community showed a steady increase each year from 2013 to 2018, reaching a recorded rate of 9.2% (Nurjayanti & Romadoni, 2023). In Malaysia, unintentional injuries, particularly those caused by road traffic accidents, significantly contribute to the overall disease burden. These accidents were a major cause of injury-related deaths, especially among males aged 15–29 years (Institute for Public Health, 2020).

In 2011, Malaysia recorded the highest annual average incidence rate of non-fatal occupational injuries in the agricultural sector, at 24.1 per 1,000 workers. The most commonly reported injuries were superficial injuries (17%), followed by sprains and strains (10%), and fractures (5%) (Ruslan et al., 2017).

A study on Malaysian Hockey League players revealed that over half of the participants (51.6%) experienced lower limb injuries. Sprains and strains were the most common types of injuries (63%), with the ankle being the most frequently affected area (29%) (Manaf et al., 2021).

First aid in managing sports injuries was considered crucial and needed to be administered appropriately and promptly. One common approach to treating such injuries was the RICE method, which stood for Rest, Ice, Compression, and Elevation. This technique, rooted in sports science, was widely recognized as an essential practice for addressing sports-related injuries (Masfufah et al., 2024).

Knowledge was an important factor in recognizing various types of injuries, understanding the factors that caused them, and determining appropriate and timely treatment based on the specific injury experienced by the individual (Hidayatullah et al., 2024). The significant risks and consequences of sports injuries highlight the need for education aimed at increasing awareness of first aid to prevent more severe complications. Given the importance of education in enhancing knowledge, nurses play a vital role as educators. They provide information and guidance to adolescents and the community, helping them understand injury prevention and promoting overall well-being to achieve optimal health (Nurjayanti & Romadoni, 2023).

First aid education was an important component of the training of health professionals, particularly nurses, who were often the first to respond to accidents and emergencies, including minor soft-tissue injuries such as sprains and strains. Although first aid training was incorporated into the nursing curriculum, it remained unclear how well nursing students learned and applied the principles of the RICE (Rest, Ice, Compression, and Elevation) method in everyday situations. There was limited information regarding the level of knowledge and practice of the RICE method among nursing students in Malaysia. This gap raised concerns about the preparedness of future nurses to manage injury-related emergencies, both in clinical settings and within the wider community. Therefore, assessing the knowledge and practice of the RICE method

among undergraduate nursing students was necessary to determine their readiness to manage such injuries effectively in both clinical and emergency contexts.

1.4 Research Questions

1. What is the level of knowledge regarding first aid of RICE method among undergraduate nursing students in USM?
2. What is the level of practice regarding first aid of RICE method among undergraduate nursing students in USM?
3. Is there any relationship between knowledge and practice of RICE method among undergraduate nursing students?
4. Is there any association between knowledge and selected socio-demographic characteristics (age, gender, formal education) of RICE method among undergraduate nursing students?

1.5 Research Objectives

1.5.1 General Objective

To determine the knowledge and practice on first aid of RICE method among undergraduate nursing students in USM.

1.5.2 Specific Objectives

1. To determine the level of knowledge among undergraduate nursing students regarding first aid of RICE method in USM.
2. To determine the level of practice among undergraduate nursing students regarding first aid of RICE method in USM.
3. To determine relationship between knowledge and practice of RICE method among undergraduate nursing students.

4. To examine association between knowledge and selected sociodemographic characteristics (age, gender, formal education) of RICE method among undergraduate nursing students.

1.6 Research Hypothesis

1.6.1 Null Hypothesis, H_0

- There is no association between level of knowledge and practice on first aid of RICE (Rest, Ice, Compression, Elevation) method among undergraduate nursing students in USM.
- There is no association between the selected sociodemographic variables (age, gender, formal education) of undergraduate nursing students and their level of knowledge on first aid of RICE method in USM.

1.6.2 Alternative Hypothesis, H_a

- There is association between level of knowledge and practice on first aid of RICE (Rest, Ice, Compression, Elevation) method among undergraduate nursing students in USM.
- There is significant association between the selected sociodemographic variables (age, gender, formal education) of undergraduate nursing students and their level of knowledge on first aid of RICE method in USM.

1.7 Significance of Study

The significance of this study lay in its aim to assess and improve the knowledge and practice of the RICE (Rest, Ice, Compression, and Elevation) method among undergraduate nursing students. The RICE method was a widely used first aid technique for managing minor injuries, such as sprains and strains, which were common in both clinical and community settings. By identifying gaps in the students' understanding and

application of this method, the study highlighted areas for improvement in their first aid training.

This research was important because nursing students were future healthcare providers who would often be the first to respond to emergencies. Ensuring they were equipped with the correct knowledge and skills to manage injuries effectively was essential for patient safety and quality care. Proper first aid practices could reduce complications, speed up recovery, and prevent long-term harm.

Additionally, the findings from this study helped inform improvements in nursing education and training programme. By addressing deficiencies and enhancing the curriculum, this research contributed to better-prepared nurses who could confidently manage first aid scenarios in their professional practice. Ultimately, this study benefited not only the students but also the broader healthcare system and the communities they served.

1.8 Definitions of Operational Terms

Definition for the operational terms used in this research proposal are as shown below:

First Aid	Emergency care or treatment given to an ill or injured person before regular medical aid can be obtained (Merriam Webster, 2024). In this study, it is referred as initial and temporary relief efforts carried out by the layman for victims, before receiving advanced assistance from medical personnel such as RICE method
RICE Method	R.I.C.E. stands for rest, ice, compression, and elevation. It is a method of self-care to use right after you experience a minor injury (Carol Eustice, 2023). In this study, it referred to a first treatment such as rest, ice, compression, and elevation.

Injury	Injury is damage to the body which results in pain, heat, redness, swelling, and unable to function properly in ligaments, joints, or bones due to excessive movement activities or accidents (Nurjayanti & Romadoni, 2023). In this study, it referred to a person who had injury such as sprain, strain, or any that harm the body/person.
Knowledge	The fact or condition of knowing something with familiarity gained through experience or association (Merriam Webster, 2024). In this study, it referred to undergraduate nursing students understanding and ability to answers questions regarding knowledge of RICE method.
Practice	To do or perform often, customarily, or habitually (Merriam Webster, 2024). In this study, it referred to undergraduate nursing students able to carry out or apply of RICE method.
Undergraduate nursing student	A person who is enrolled in an approved School of Nursing and who is employed by the Employer to provide nursing but is not Graduate Nurse, Graduate Psychiatric Nurse (Undergraduate Nurse Definition, 2024). In this study, it is referred as participant of this research to assess knowledge and practice regarding first aid of RICE method which include diploma and degree nursing students with the total population is 229.

<p>Nursing student that are registered nurses</p>	<p>Any individual formally enrolled in the College of Nursing in pursuit of a BSN or Graduate degree, including registered nurses (RN), students taking courses via distance education, special students, or individuals in post-graduate study, either alone or in combination with any other degree, regardless of the specific location of the student (Nursing Student Definition, 2024). In this study, it is referred as participants who were excluded in assessing knowledge and practice regarding first aid of RICE method.</p>
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CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter reviewed the current literature related to knowledge and practice of first aid using the RICE (Rest, Ice, Compression, Elevation) method among undergraduate nursing students, as well as the association between selected sociodemographic factors and knowledge. Finally, this chapter provided a detailed description of the conceptual framework chosen for the proposed study.

2.2 Overview of First Aid

First aid (FA) referred to the initial medical assistance administered by either healthcare professionals or laypersons at the scene of an accident or to an individual who was injured or critically ill, before the arrival of an ambulance or additional medical help. Any individual could initiate first aid actions during an emergency, requiring minimal or almost no equipment (Albadrani et al., 2023).

Accidents and illnesses could sometimes be life-threatening, leaving little time for a responder to act to prevent permanent disabilities or even death. In such situations, first aid was the immediate assistance needed to save lives and prevent injuries from worsening. It played a critical role in almost all emergencies, disasters, and dangerous situations by helping to stabilize the condition until further medical help arrived (Abd-Elsamea et al., 2018).

According to Mohd Sharif et al. (2018), first aid was essential for nursing training. Moreover, it was also important for the general population to have basic knowledge of life support and emergency procedures (Mohd Sharif et al., 2018).

Despite its importance, studies by Baser et al. (2007), Joseph et al. (2015), and Midani et al. (2019) showed that first aid knowledge among the general population was

lacking. A study conducted in 2018 found that 75.6% of Spanish people considered their knowledge of first aid to be insufficient (Ramírez-Torres et al., 2023).

First aid (FA) training tended to be overlooked in medical education programs. Numerous studies highlighted unsatisfactory outcomes regarding the preparedness of medical students and trainees in the field of FA. Earlier investigations indicated that healthcare practitioners possessed limited understanding and skills in executing first aid procedures. Furthermore, some studies showed that healthcare professionals viewed first aid involvement unfavourably, largely due to a lack of confidence and competence in carrying out the necessary procedures (Albadrani et al., 2023).

At some stage in their medical training, students learned how to manage emergencies within a hospital environment, where they had access to medications and necessary equipment. However, their knowledge was often insufficient for handling emergencies outside the hospital setting, at the actual site of an accident or crisis where such resources were unavailable.

According to Abd Elsamea et al. (2018), the overall knowledge of first aid among medical, dental, and nursing students was very poor and needed improvement. Studies from the United Arab Emirates showed that integrating formal first aid sessions into the medical curriculum equipped students with solid knowledge and practical skills. To further strengthen this learning, these sessions were recommended to be complemented with hands-on experience or activities to increase students' practical skills during medical school (Abd-Elsamea et al., 2018).

2.3 Overview of RICE Method in First Aid

Injuries, particularly soft tissue injuries such as sprains, strains, and minor bruises, were common occurrences, especially during sports, physical activities, or daily routines. Proper management of these injuries was crucial to ensure optimal recovery and prevent long-term damage. One of the most widely recognized first aid techniques for such injuries was the RICE method.

The RICE protocol had been the preferred treatment method for acute musculoskeletal injuries since its introduction in a 1978 publication titled *Sports Medicine Book* by Dr. Gabe Mirkin. These guidelines had been used by coaches and healthcare providers for over four decades with the intent of expediting the recovery process and reducing inflammation (Scialoia, 2020).

The first component of the RICE method was Rest, which was crucial in protecting the injured area and allowing the body time to initiate healing. Rest was required to reduce the metabolic demands of the injured tissue and thus avoid increased blood flow. It was also necessary to prevent stress on the injured tissues that might have disrupted the fragile fibrin bond, which was the first element of the repair process. Rest could be applied selectively to allow some general activity, but the patient had to avoid any activity that induced stress or strain on the injured area, thereby compromising the healing process.

Ice was the second component of the RICE method and played a vital role in reducing inflammation, pain, and swelling at the injury site. Ice was used to limit injury-induced damage by reducing the temperature of the tissues at the site of injury and consequently decreasing metabolic demand, inducing vasoconstriction, and limiting bleeding. It also helped reduce pain by increasing threshold levels in the free nerve endings and at synapses, and by increasing nerve conduction latency to promote analgesia.

The third component was Compression, with the goal of stopping haemorrhage and reducing swelling. Compression was applied to limit the amount of oedema caused by the exudation of fluid from damaged capillaries into the tissue. By controlling the amount of inflammatory exudate, compression reduced the formation of fibrin and ultimately scar tissue, while also helping to control the osmotic pressure of the tissue fluid in the injured area.

The fourth component was Elevation. Elevation of the injured part lowered the pressure in local blood vessels and helped limit bleeding. It also increased drainage of the inflammatory exudate through the lymphatic vessels, thereby reducing and limiting edema and its associated complications (Van Den Bekerom et al., 2012).

Each component of the R.I.C.E method served a distinct and important function, working together to effectively treat injuries. The R.I.C.E injury management method aimed to provide treatment for inflammation during the first 24–48 hours following the injury. Early intervention played a critical role in determining how quickly an injury healed. If the initial treatment was not properly applied, it could have negatively impacted the injured person and led to a prolonged recovery (Hidayatullah et al., 2024).

2.4 Knowledge on First Aid of RICE Method

Knowledge of RICE first aid was important and should have been introduced to high school-aged students, particularly those involved in physical sports activities. By equipping students with first aid skills, they were able to respond to injuries effectively and help prevent them from worsening. Educational activities that focused on first aid were essential for providing school-age children with the knowledge and experience needed to handle injuries, promoting safety and preparedness in sports and other physical activities (Nurjayanti & Romadoni, 2023). However, it was equally important for individuals of all ages, especially those participating in physical activities, to learn the

RICE method. This method could be applied in a wide range of situations to promote injury recovery.

A study by Mawarda and Nurjannah (2024) that tested the knowledge levels of KSR students revealed significant differences before and after receiving health education. Prior to the educational intervention, 29 students (40.3%) were classified as having poor knowledge. After the health education, 34 students (47.2%) demonstrated good knowledge. The findings indicated a notable improvement in the respondents' knowledge levels following the health education, suggesting that such interventions could positively impact students' understanding and awareness of health-related topics (Mawarda & Nurjannah, 2024).

A study on the level of student knowledge regarding handling sports injuries using the R.I.C.E method in the FKIP Physical Education Study Program at Bengkulu University showed that the level of knowledge was "Very High" in 54 students (61.36%), while 34 students (38.64%) were categorized as having "High" knowledge. This indicated that the students had a high level of knowledge regarding the management of sports injuries using the R.I.C.E method (Hidayatullah et al., 2024).

According to a study conducted among Merpati Putih athletes, there was an improvement in respondents' knowledge following the receipt of new and valuable information. Before the educational intervention, less than 15 individuals (40.5%) were categorized as having "poor" knowledge, while 22 individuals (59.5%) were categorized as having "sufficient" knowledge. After the educational program, only 8 individuals (21.6%) remained in the "sufficient" category, while 29 individuals (78.4%) progressed to the "good" knowledge category (Novita & Yulistiani, 2024).

A study conducted among STKIP PGRI Bangkalan sports education students, class of 2020, suggested that students particularly those studying sports education and first aid

for sports injuries generally had a poor understanding of the RICE method. The research results showed that 0% of students were categorized as having “very good,” “good,” or “enough” knowledge, while 93% fell into the “less” category and 7% were in the “very less” category (Masfufah et al., 2024).

2.5 Practice on First Aid of RICE Method

A study conducted among KSR students demonstrated the effect of training on first aid skills for managing sprains and strains using the RICE method. The results from the pre-test, conducted before the training, showed that 39 students (54.2%) had skills categorized as “sufficient.” Following the training, the post-test results revealed an improvement, with 42 students (58.3%) achieving the “good” skill category (Mawarda & Nurjannah, 2024).

Similarly, a study among Merpati Putih athletes showed that, prior to the intervention, 22 participants (59.5%) were categorized as “moderately skilled,” 14 participants (37.8%) as “skilled,” and 1 participant (2.7%) as “highly skilled.” After the intervention, 22 participants (59.5%) remained in the “moderately skilled” category, while 15 participants (40.5%) improved to the “skilled” category. Comparable findings were reported in another study involving a sports injury first aid simulation using the PRICES method, where participants’ scores increased from a pre-simulation maximum of 68 to a post-simulation score of 93. These results indicated that health education significantly improved the futsal players’ skills in administering first aid for sports injuries. These findings were consistent with the study by Novita and Yulistiani (2024), which also demonstrated that simulations effectively enhanced participants' first aid skills for managing sports injuries (Novita & Yulistiani, 2024).

2.6 Relationship of Knowledge and Practice on First Aid of RICE

Method

A study conducted on KSR Samarinda students assessed the impact of health education and training on their knowledge and skills in applying the RICE method for first aid in cases of sprains and strains. The findings revealed that, prior to the intervention, a significant proportion of respondents (29 students, or 40.3%) had limited knowledge. Following the intervention, most respondents demonstrated improved understanding, with 34 students (47.2%) achieving a good level of knowledge. Regarding practical skills, the majority initially possessed moderate abilities (39 students, or 54.2%). However, post-intervention results indicated notable improvement, with 42 students (58.3%) classified as having good skills. These outcomes suggested that health education and training had a positive effect on the knowledge and skills of KSR students in applying the RICE method in Samarinda (Mawarda & Nurjannah, 2024).

Similarly, a study investigating the influence of first aid education on Merpati Putih athletes found that both knowledge and skills significantly improved after training on the RICE method. Before the intervention, 59.5% of respondents were categorized as having moderate knowledge, while 40.5% had low knowledge. After the training, 78.4% of participants demonstrated good knowledge. In terms of skills, 59.5% were initially unskilled; however, following the intervention, 40.5% were classified as skilled, while the remaining respondents achieved moderate skill levels (Novita & Yulistiani, 2024).

In conclusion, the findings from both studies underscored a strong positive correlation between health education and improved knowledge and practical skills in first aid, particularly regarding the application of the RICE method.

2.7 Association Knowledge and Selected Socio Demographic

2.7.1 Age

According to Dewi (2021), late adolescence was included in the age group of 17–25 years, which age could clearly connect the information received into their life and was able to understand themselves better (Dewi, 2021).

Teenagers in the final stages had an easier time understanding everything, including adding knowledge and preparing for adulthood (Pangkey et al., 2022). This was shown by results at Jenderal Achmad Yani University, Yogyakarta, where most respondents were in the 20–21 age range (56.6%) and had the highest level of knowledge of injury management in the good category (79.7%) (Hardyanto & Nirmalasari, 2020).

2.7.2 Gender

Based on a study by Hardyanto & Nirmalasari (2020), the results showed that most respondents were male, with 41 males (59%) and 28 females (41%). The gender distribution might have been influenced by various factors. According to Wang et al. (2012), men tended to have higher rates of sports injuries than women because they generally spent more time exercising and engaging in physical activities. In terms of knowledge, most respondents (79.7%) in that study demonstrated good knowledge of the RICE method (Hardyanto & Nirmalasari, 2020). This suggested a positive association between male participants and knowledge of the RICE method.

However, this contrasted with the findings of the study by Gst et al. (2020), which also had most male participants (71.6%) but only 13.7% of respondents showed good knowledge of the RICE method (Gst et al., 2020). This suggested that gender by itself might not have been a key factor in understanding the RICE method, given that knowledge levels differed even though both studies had a majority of male participants.

2.7.3 Formal Education

A study conducted among Football UKM students at a private university in Western Indonesia revealed that 34 respondents (85%) had received information about the RICE technique, while 6 respondents (15%) had never been informed about Rest, Ice, Compression, and Elevation (RICE). The results indicated that 29 respondents (72.5%) demonstrated good knowledge of the RICE method, whereas only 1 respondent (2.5%) exhibited poor knowledge. This indicated a solid understanding of first aid for acute injuries among students when they received formal education regarding the RICE method (Pangkey et al., 2022).

A study conducted at UKM Olahraga of Widya Mandala Catholic University, Surabaya showed that only 13 (13.7%) respondents had good knowledge out of a total of 95 students. According to the author, this was due to the lack of education received by respondents regarding early treatment of acute injuries using the RICE technique. Additionally, the lack of exposure to information through print or electronic media contributed to their low level of knowledge (Gst et al., 2020).

2.8 Theoretical and Conceptual Framework

The Health Belief Model (HBM) was used as the conceptual framework in this study. The HBM focused on two aspects of individuals' representations of health and health behaviour: threat perception and behavioural evaluation. Threat perception was construed as two key beliefs: perceived susceptibility to illness or health problems, and anticipated severity of the consequences of illnesses. Behavioural evaluation also consisted of two distinct sets of beliefs: those concerning the benefits or efficacy of a recommended health behaviour, and those concerning the costs of, or barriers to, enacting the behaviour. This model was usually operationalized as a series of up to six separate

independent variables that potentially accounted for variance in health behaviours (Abraham, 2015).

Perceived susceptibility meant the subjective perception of risk to an illness or a disease. There was considerable variation in the feelings of a person about personal vulnerability to an illness or a disease. Perceived severity referred to one's perception about the severity of an illness in case one got it or the consequences of not getting treated. People varied largely in conceptualizing severity as most considered medical consequences, such as death or disability, and social consequences, such as family dynamics or personal relationships, while determining the severity of an illness.

Perceived barriers referred to a person's perceptions of the real or imagined barriers that kept people from taking a recommended health action. People's perceptions of barriers often varied substantially, and as a result, they conducted a cost-benefit analysis weighing the effectiveness of potential actions against their perceptions of drawbacks, which might have included concerns about expense, safety such as side effects, discomfort or pain, time consumption, or inconvenience.

Cues to action were the triggers that stimulated an individual to take the recommended health action through a decision-making process. Self-efficacy referred to an individual's confidence in their capability to successfully perform a behavior. Self-efficacy was added to the model in the mid-1980s and became part of most behavioral theories, where whether a person enacted the behavior directly depended on it (Wayne W. LaMorte, 2022).

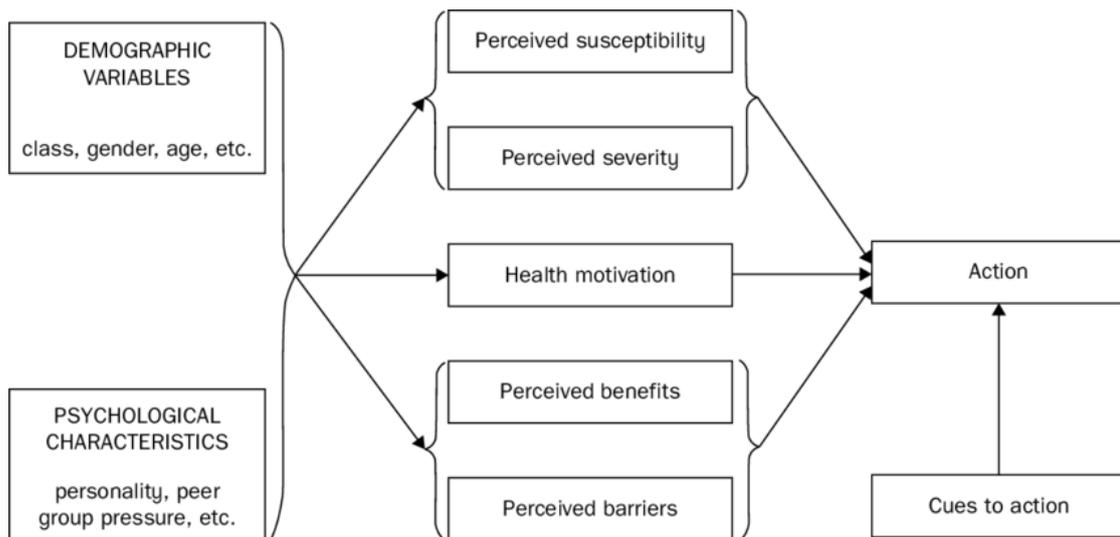


Figure 2.1 Health Belief Model (HBM)

Figure 2.2 showed the adapted Theory of Health Belief Model from (Abraham, 2015). The Health Belief Model was advantageous for this study because it comprehensively addressed factors influencing health-related practices, such as knowledge, confidence, and perceived barriers, making it an ideal framework for evaluating nursing students' application of first aid techniques like RICE.

Perceived Susceptibility referred to an individual's belief in their own vulnerability to health issues or injuries. In the context of nursing students, it reflected how likely they thought they were to encounter situations where the RICE method would be needed, such as sports injuries or clinical emergencies.

Perceived Susceptibility referred to an individual's belief in their own vulnerability to health issues or injuries. In the context of nursing students, it reflected how likely they thought they were to encounter situations where the RICE method would be needed, such as sports injuries or clinical emergencies.

Perceived Severity was the belief in how serious the consequences of an injury or illness might be. For nursing students, this related to the potential long-term effects of not applying the RICE method correctly, such as prolonged recovery or chronic pain.

Perceived Benefits highlighted the positive outcomes of taking appropriate health actions. For example, students might have been motivated to use the RICE method because it helped reduce swelling, alleviate pain, and prevent further injury. However, Perceived Barriers addressed the obstacles that prevented individuals from taking action, such as lack of knowledge, confidence, or proper training. These barriers may have hindered nursing students from applying the RICE method effectively.

Cues to Action were the triggers that prompted individuals to engage in health-promoting behaviours. For nursing students, cues might have included hands-on experience in clinical settings, exposure to training, or witnessing real-life injuries that demonstrated the importance of proper first aid.

Finally, Self-Efficacy referred to an individual's confidence in their ability to successfully carry out the recommended health behaviour. In this study, it pertained to nursing students' belief in their ability to apply the RICE method correctly in emergency situations.

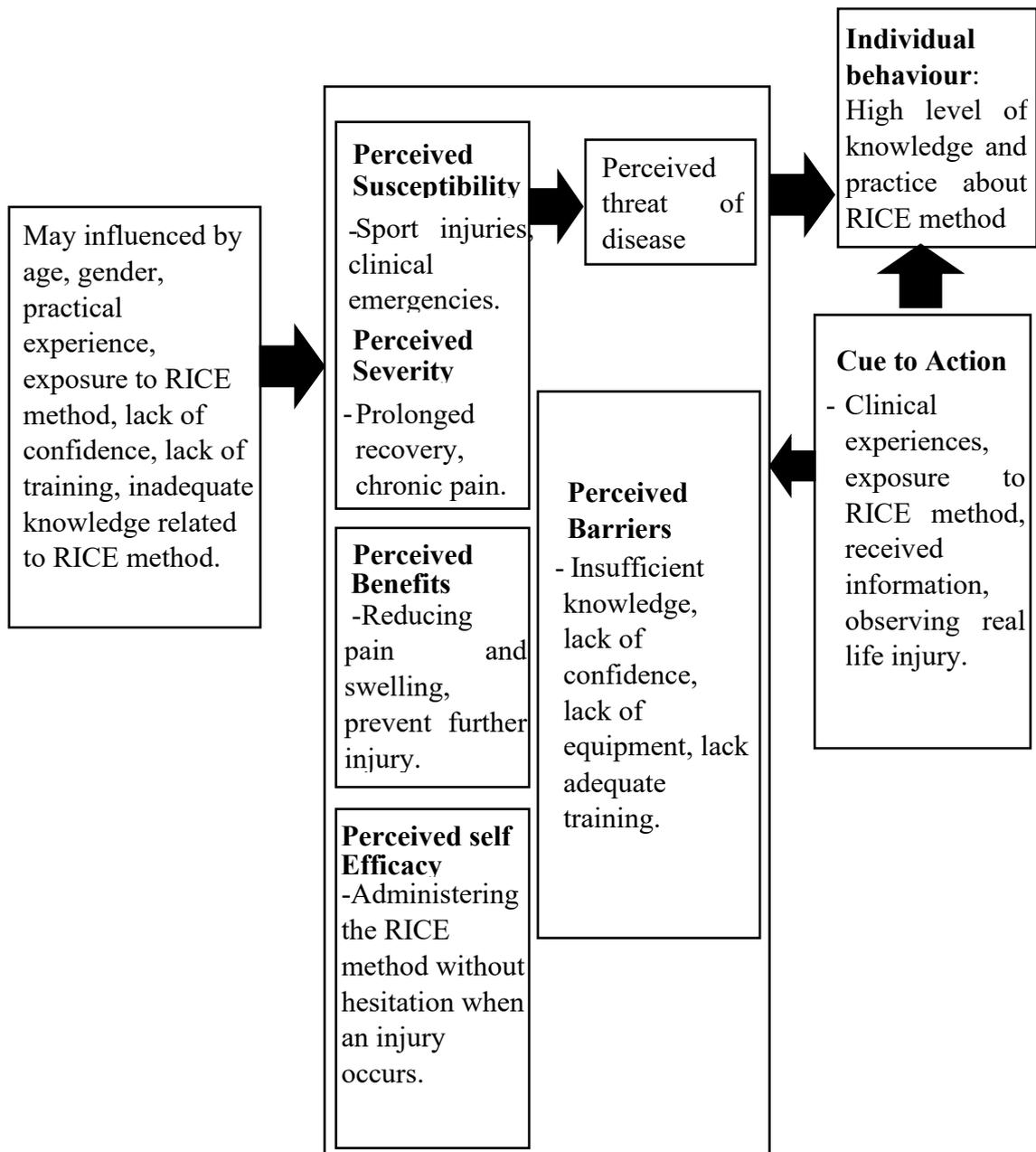


Figure 2.2The Adapted Health Belief Model (HBM) (Abraham, 2015)

CHAPTER 3: METHODOLOGY

3.1 Introduction

In this chapter, the researcher described the methodology and methods chosen in conducting the study in terms of research design, sample selection, data collection and data analysis. In addition, the researcher detailed ethical consideration of the study is listed as part of a requirement to the conduct this study.

3.2 Research Design

This study used a cross sectional study design. Studies with a cross-sectional study design involved the collection of information on the presence or level of one or more variables of interest, whether exposure or outcome) as they existed in a defined population at one time (Aggarwal & Ranganathan, 2019). This approach was considered appropriate to provide a detailed description of the participants' knowledge and practice of first aid using the RICE method among undergraduate nursing students at Universiti Sains Malaysia.

3.3 Study Setting and Population

This study was conducted at Universiti Sains Malaysia, Kelantan, Malaysia. Undergraduate nursing students at USM were selected as representatives of the population. This group was chosen to determine their level of knowledge and practice regarding first aid, specifically the RICE method. The study was conducted among undergraduate Degree and Diploma nursing students at USM across all years. Refer to Table 3.1.