KNOWLEDGE AND PRACTICES ON FIRE SAFETY AMONG UNDERGRADUATES OF SCHOOL OF HEALTH SCIENCES IN HEALTH CAMPUS, USM

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KNOWLEDGE AND PRACTICES ON FIRE SAFETY AMONG UNDERGRADUATES OF SCHOOL OF HEALTH SCIENCES IN HEALTH CAMPUS, USM

by

AMIRAH BALQIS BINTI MUHAMAD SHAHIRAN

Dissertation is being submitted in partial fulfillment of the requirement for the degree of Bachelor of Nursing (Honours)

JULY 2023

CERTIFICATE

This is to certify that the dissertation entitled “Knowledge and Practices on Fire Safety among Undergraduates of School of Health Sciences in Health Campus, USM” is the research work done by Ms “Amirah Balqis Binti Muhamad Shahiran” during the period from October 2022 until July 2023 under my supervision. I have read this dissertation and that in my opinion it conforms to acceptable standards supervision of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfillment for the degree of Bachelor of Nursing (Honours).

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DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated and duly acknowledged. I also declare that it has not been previously or concurrently submitted 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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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

FDRM - Fire and Rescue Department of Malaysia

HREC - Human Research Ethics Committee

KTA - Knowledge to Action

NFPA - National Fire Protection Association

SPSS - Statistical Package Social Sciences

US - Unites State

USM - Universiti Sains Malaysia

ABSTRAK

Kecemasan kebakaran merupakan ancaman kepada pelajar yang tinggal di kediaman tempat mereka belajar. Beberapa kolej kediaman Malaysia telah dibina pada tahun 1990-an termasuk Desasiswa di Kampus Kesihatan, USM. Objektif utama kajian ini adalah untuk menilai tahap pengetahuan dan amalan keselamatan kebakaran serta mengenal pasti perkaitan antara kedua-dua pengetahuan dan amalan pelajar di Kampus Kesihatan USM. Reka bentuk kajian keratan rentas digunakan dalam kajian ini. Insturmen yang telah digunakan dalam kajian ini merupakan soal selidik tinjauan dalam talian dan telah dijawab oleh seramai 359 orang responden yang memenuhi kriteria kajian ini. Statistik deskriptif digunakan untuk menjelaskan data responden dan memenuhi objektif kajian. Pearson Chi-square digunakan untuk menguji perkaitan antara pembolehubah. Hasil kajian ini menunjukkan majoriti responden (pelajar Sains Kesihatan) mempunyai tahap pengetahuan yang tinggi (79.7%) dan tahap amalan yang tinggi (74.7%) tentang keselamatan kebakaran. Hasil kajian menunjukkan terdapat hubungan yang signifikan antara tahap pengetahuan dan amalan dengan nilai $p<0.05$. Walaupun kajian ini kelihatan sangat tertumpu kepada keselamatan, ia masih memberi implikasi kepada sektor kesihatan untuk membuat persediaan menghadapi bencana buatan manusia. Intervensi utama seperti bengkel, seminar dan latihan kebakaran perlu dijalankan secara berkala mengikut amalan terbaik kempen kesiapsiagaan bencana dan disyorkan untuk menambah baik hasil kajian ini. Secara keseluruhannya, kajian ini penting bagi mereka dalam bidang amalan keselamatan dan kesihatan yang berkaitan dengan kecederaan kebakaran dan risiko kebakaran yang lain.

ABSTRACT

Fire emergencies are a threat to undergraduates who live in residences where they study. Several Malaysian residential colleges were built in the 1990s including Desasiswa at Health Campus USM. The main objective of this study is to assess the level of knowledge and practice of fire safety and identify the relationship between both knowledge and practices of students at the USM Health Campus. A cross-sectional study design was used in this study. The instrument used in this study was online survey questionnaire and has answered by a total of 359 respondents who met the criteria of this study. Descriptive statistics were used to explain the respondent's data and meet the objectives of the study. Pearson Chi-square was used to test the association between variables. The results of this study showed that most respondents (Health Science students) had a high level of knowledge (79.7%) and a high level of practice (74.7%) about fire safety. The results of the study showed that there was a significant association between the level of knowledge and practices with a p value <0.05. Although this study appears to be very focused on safety, it still has implications for the health sector to prepare for man-made disasters. Key interventions such as workshops, seminars and fire drills should be conducted regularly according to the best practices of disaster preparedness campaigns and are recommended to improve the results of this study. Overall, this study is important for those in the field of safety and health practice related to fire-related injuries and other fire risks.

INTRODUCTION

This first chapter, the researcher reveals the background of the study that has been conducted. The researcher has also described in this chapter the purpose to conduct this study among undergraduates of School of Health Sciences in Health Campus, Universiti Sains Malaysia (USM). In addition, researcher have also listed some questions, objectives, hypothesis, and significance of conducting this study.

1.1 Background of the Study

Accommodation is used to refer to buildings or rooms where people live or stay. (Student Accommodation Definition and Meaning | Collins English Dictionary, n.d.). In this new global era, a conducive, full-furnished, and well-equip accommodation is one of the very vital in human beings as fulfill the pyramid in Maslow hierarchy of needs (*Maslow's Hierarchy of Needs - Simply Psychology*, n.d.). Hostels residents is shelter for students attending a university, and is expected to provide attractive environment, conducive for learning and academic success, appropriate electrical with codes or standards, and adequate safety features (Hassanain, 2008).

Those electrical appliances which are installed without adequate ventilation, it is possible to overheat, and this may eventually overload the circuits (Aigbodion, 2014). Even though electricity energy is essential to human life, it has potential to lead to electrical fire too. The previous study explains, an electrical fire is a fire directly caused by the flow of electric current or by static electricity (Babrauskas, 2008). Most of the injuries occur because lack of knowledge of electricity and its dangers (Aigbodion, 2014). Fire might release large amounts of carbon dioxide, carbon monoxide and fine particles

into the atmosphere. The resultant air pollution can cause a variety of health problems, including respiratory and cardiovascular problems (World Health Organization - WHO, 2019).

The incidence and mortality of injuries that result from fire, heat and hot substances affected every region of the world (Stewart, 2022). Even though the fire is non-fatal shocks, it can cause severe and permanent injury. The findings of the previous study by Shokouhi et al. (2019), the factors to reduce the risk of fire-related injuries raised in the studies under review included rule alterations, changes and modification of the environment, behavior change such as emergency evacuation during fire occurrence, improvements to emergency medical services, and awareness-raising. Hence, to relieve these adverse effects of fire injury, it is important to provide necessary fire safety in buildings (Kodur et al., 2020). More resources should be invested in measuring these injuries as well as in improving infrastructure, advancing safety measures, and ensuring access to care. Life safety is one of the most important and minimum requirements buildings must meet. Whether a building can meet this requirement depends on the ability of occupants in the building to successfully evacuate from it in the case of emergencies like a fire prior to the onset of unsustainable conditions in the emergence routes (Zhang et al., 2014). Most of these fire accidents can be prevented by apply the knowledge on fire safety and adequate practices (Aigbodion, 2014).

1.2 Problem Statement

On November 2019, World Health Organization (WHO) had announced of the epidemic outbreak the Covid-19 disease (Elengoe, 2020). Malaysia is also included in the countries affected by the norm. On 18th March 2020, the Malaysian government implemented a Movement Control Order (MCO) involving all citizens residing in Malaysia. In accordance with the Prevention and Control of Infectious Diseases Act 1988 and the Police Act 1967, this order acts as an effort to control the spread of Covid-19 nationwide. The implications of the implementation of the government order also affected activities at institutes of higher learning. Higher education institutions and skill training institutes nationwide were closed (Elengoe, 2020). The vacancy of student accommodation has long resulted in no fire security-related activities being carried out, especially fire drill practice. It will become more important when the students return to the institutes with no adequate exposure to fire safety. This is because the building fires are believed to be a major threat most fire cases in educational institutes occur during academic sessions rather than during the term holidays when there are not many university residents (Zakaria et al., 2019).

Most of these facilities are multi-story buildings, residents located on the upper floors can have problems escaping due to the congestion and commotion found at the exit and when going down the stairs (Cung, 2019). Therefore, residents must practice fire drills regularly to achieve overall protection from fire that can spread to buildings as well (Poon, 2013). Fire drill is a method of practicing the evacuation of a building for a fire or other emergency. The fire drill serves as an opportunity for the occupant to demonstrate, under simulated fire conditions, that they can perform evacuation safely and ensure they are aware enough of those responsibilities. Building fires are thought to be a major threat

to the safety of the building residents and are mostly caused by people's behavior (Kodur et al., 2020).

A study related to design and operational factors in student housing facilities that affect fire risk was conducted as early as 1998 by Hassanain. It categorizes some common designs deficiencies that contribute to student housing fires and review measures to prevent fires in student housing facilities. The student's accommodation is usually equipped with various fire-load facilities such as wooden cupboards, mattresses, curtains, and other fire-conducting materials. The student facilities which have possible types of fire loads include wooden furniture, books, paper, and plastic displays, which are often hung from ceilings and curtains.

The study found that students are generally unaware of the risks they face, and that postsecondary institutions have trouble targeting and creating action plans (Mohamed Yusof et al., 2021). Sometimes, occupants lack a clear understanding of the logic towards fire protection features and it is common when they make mistakes while responding to the emergency events (Zakaria et al., 2019). The poor knowledge and preparedness of general emergency are commonly cause by a lack of exposure to educate themselves (Francioli et al., 2015). Study from AlWaqfi et al. (2022) shows that the respondents who had fire drill training were prone to have acceptable knowledge compared to those who had not. Hence, the fire drill and training can be the factor with significant predictor of someone’s knowledge.

1.3 Research Question

The research question for this study are:

i. What is the level of knowledge on fire safety among undergraduates of School of Health Sciences in Health Campus, USM?

ii. What is the level of practices on fire safety among undergraduates of School of Health Sciences in Health Campus, USM?

iii. What is the association between level of knowledge and practices on fire safety among undergraduates of School of Health Sciences in Health Campus, USM?

1.4 Research Objective

1.4.1 General Objective

To evaluate the knowledge and practices on fire safety among undergraduates School of Health Sciences in Health Campus, USM.

1.4.2 Specific Objective

i. To assess the level of knowledge on fire safety among undergraduates of School of Health Sciences in Health Campus, USM.

ii. To assess the level of practice on fire safety among undergraduates of School of Health Sciences in Health Campus, USM.

iii. To identify the association between level of knowledge and practices on fire safety among undergraduates of School of Health Sciences in Health Campus, USM.

1.5 Research Hypothesis

1.5.1 Null Hypothesis, H_0

There is no significant association between knowledge and practices among undergraduates of School of Health Sciences in Health Campus, USM.

1.5.2 Alternative Hypothesis, H_A

There is a significant association between knowledge and practices among undergraduates of School of Health Sciences in Health Campus, USM.

1.6 Conceptual and Operational Definition

Table 1.1 Operational definition and conceptual definition

Terms	Conceptual Definitions	Operational Definitions
Knowledge	Knowledge is considered as a collection of experience, appropriate information and skilled insight which offers a structure for estimating and integrating new experiences and information (Mohajan, 2017).	The knowledge refers to the awareness of undergraduates towards fire safety. The level of knowledge was used as a baseline to determine the current state of fire safety understanding which may reduce the risk of fire-related injuries.
Practices	Practice is any form of activity specified by a system of rules	The practice is the application or action of

	which defines. Offices, roles, moves, penalties, defenses, and so on (Rawls, 2020).	rules and knowledge towards fire safety among undergraduates. The good practices indicate the progress of knowledge and technology and run-in ethical manner.
Fire Safety	Fire is one type of disaster which poses a crucial threat to life (Ayuni et al., 2020) and safety is stated as being away from hazards caused by natural forces or human errors randomly. The source of hazard is formed by natural forces and human errors (Science, 2015).	Fire in the context of this study means insufficient exit from any part of a building to any place either inside or outside that provides protection to people in the event of a fire. Fire safety in this context of study defines as set of knowledge and practices to minimize the destruction caused by any fire incident.

1.7 Significance of the Study

Since fire cases have caused property losses and claimed many injures of people every year, this study might help in reducing those losses by identifying the level of fire safety knowledge and practices among USM students. In addition, this study will raise a sense of protection in this university area. Protection in this phrase can be described as protection of property and life (Shokouhi et al., 2019). This study is important to identify some elements that function as emergency preparedness of fire outbreaks for the undergraduates of School of Health Sciences in Health Campus, USM. A state of preparedness is a combination of planning, allocation of resources, practices, and local primary response level based towards strategic risk assessment (World Health Organization - WHO, 2019). The strategic risk assessment may be applied to the fire hazard which may lead to emergency outbreaks. It is hoped that the findings in this study can be used as a useful reference or guideline to obtain information related to fire safety awareness soon at USM.

CHAPTER 2: LITERATURE REVIEW

This chapter will present a literature review related to fire safety knowledge and practice. This chapter includes evidence that is relevant to answer the research question, and fulfill the objective of the study, whether agree or not with the hypothesis.

The main part begins with the knowledge about fire safety, the level of compliance through fire safety and practices in USM. The final part of this chapter will detail the conceptual framework of the 'Knowledge to Action' Framework that led this study.

2.1 Content of Literature Review

2.1.1 Current Issue on Fire Outbreaks

In the United States, from 2015-2019 electrical distribution or lighting equipment, such as wiring, lighting, cords, or plugs, was involved in an estimated average of roughly 32,620 reported home structure fires per year. These incidents caused an average of 430 civilian deaths, 1,070 civilian injuries, and $1.3 billion in direct property damage annually (*Electrical Safety in the Home | NFPA*, n.d.). Based on National Fire Protection Association, (NFPA) 901 and the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS), from 2017 to 2019, an estimated 11,650 civilian fire injuries resulted from 7,200 residential building fires resulting in injuries. From 2017 to 2019, civilian fire injuries in residential buildings accounted for 75% of all estimated fire injuries. On average, someone is injured in a residential building fire every 45 minutes (U.S Fire Administration, 2021).

During 2020, Annual Report from the Fire and Rescue Department of Malaysia (FRDM) attended to 38,865 fire calls and loss value about 2 billion Malaysia Ringgit

(MYR 2 billion). The buildings fire was recorded as second highest incident which brings 4,599 cases. From this total, Selangor recorded the highest cases in fire buildings followed by Johor and Sabah which were 1,020 cases (22.2%), 485 cases (10%) and 419 cases (9.1%) respectively (Fire and Rescue Department of Malaysia, 2020). According to Fire Services Act 1988 (Act 341), building owners for management is responsible for occupant safety through self-declaration of the fire certificate under the fire regulation. Life safety is the prime objective when it comes to fire safety and building regulations.

In 2017, Malaysia was stunned with the blaze that occurred at the Darul Quran Ittifaqiyah Tahfiz center in Jalan Keramat Ujung Kuala Lumpur. The blaze has been described as the country's worst fire disaster in 20 years. The blaze claimed the lives of 23 students between the ages of 13 and 17 and two dormitory wardens. Four students who survived the incident were seriously injured. From the investigation by the Fire and Rescue Department, there is only one exit and entrance to the dormitory room. The buildings were undergoing an interior renovation which built more dividers and one of the exits was closed off. Due to the limited way out when the fire was bursting, the student victims were determined to break the doors, windows and even conduits in the building. However, window grilles cannot be accessed from the inside and doors blocked by a large item from the outside hindered that effectiveness. This causes them to be completely trapped inside the dormitory due to the heavy smoke and raging fire. From this event, other institutes, including hostels in higher education, need to take a lesson from the issue highlighting by the Fire and Rescue Department, which is to provide special fire exits in every building, especially those that are inhabited (New Straits Times, 2017). The buildings must meet the fire risk standards which are categorized under the law. These

orders are important when the emergency happens, and the massive damage can be avoided at an early stage (Mohammad Hamdan, 2022).

2.1.2 Knowledge and Practices of Fire Safety among Students

The study by Alrazeeni (2015) showed that students lack the knowledge and skills required to provide optimal emergency management and disaster response. Students reported poor to moderate levels of disaster preparedness (knowledge and skills) which included inadequate student abilities to participate in catastrophic events. Results from a study by Sinha et al (2008) found that medical students have very little knowledge, attitudes and practices about disaster preparedness and mitigation. However, Hubloue and Debacker (2010) stated that disasters and mass casualty events require extraordinary knowledge and skills to provide health care in a primitive or aggressive environment and the ability to systematize disaster response.

Additionally, this finding can be explained by the fact that students may receive limited disaster management education in their undergraduate programs. This is consistent with Bajow et al (2015), who reported that integrating disaster preparedness in training enables graduate students to improve disaster preparedness. However, Joes and Dufrene (2014) consider preparing for disaster events as the highest priority for healthcare professionals. They also state that current students are tomorrow's practitioners. Therefore, integrating disaster preparedness in the curriculum is very important to expose students to the right attitude and knowledge to be prepared for disasters.

2.2 Theoretical and Conceptual Framework of the Study

Conceptual frameworks are recommended as a way of applying theory to improve implementation efforts. World health experts exchange opinions on translating the best available evidence into real health. A theoretical understanding of how and when to provide effective care and services. The 'Knowledge to Action' (KTA) Framework was developed in Canada by Graham and his colleagues in the 2000s, following a review of 31 planned action theories. The framework has two components: Knowledge Creation and an Action Cycle, each of which includes multiple phases. The KTA Framework is also being used in practice with varying degrees of completeness (Field et al., 2014).

Each component involves several phases which overlap and can be iterative. Action phases may be carried out sequentially or simultaneously which knowledge phases may impact on the action phases. The knowledge is adapted to the local context, and barriers and facilitators to its use are explicitly assessed.

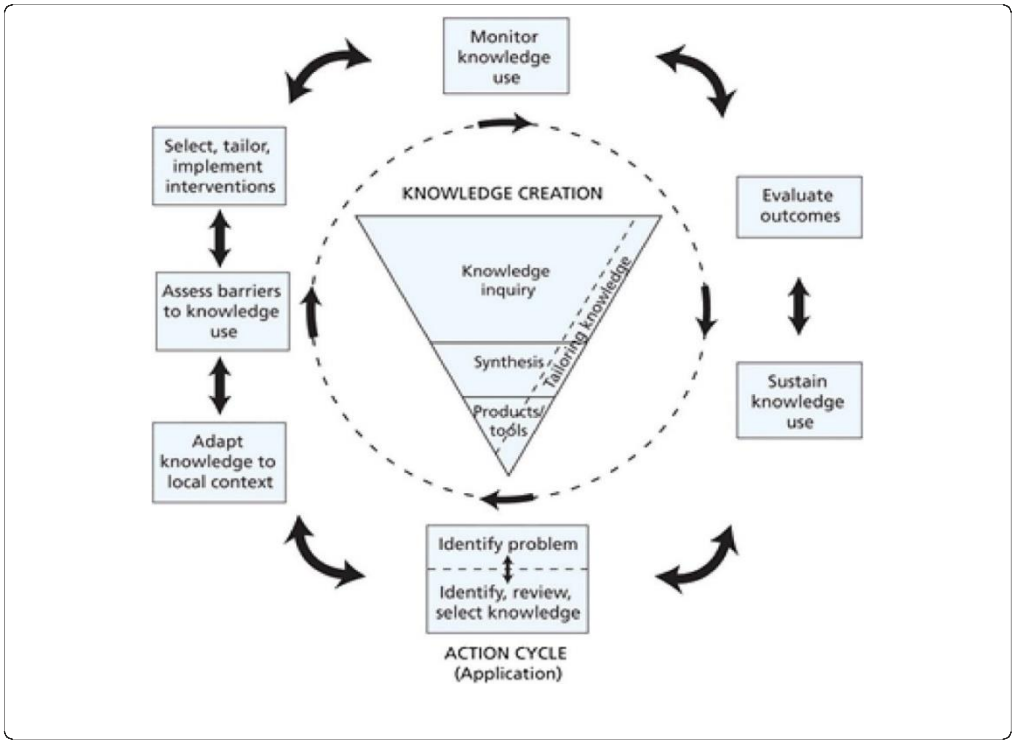

Figure 2.1 The Knowledge to Action Framework

This study is focusing on identifying the level of knowledge and practices on fire safety among undergraduates in Health Campus, USM. Hence, the conceptual framework for this study has been adapted from the 'Knowledge to Action' Framework. The KTA Framework is commonly used in practices with measure of inclusiveness. This study chooses KTA Framework as preferred method applications as it is closely related to the research objectives. From the framework, the results of this study can show that students benefit from their perception of fire safety around their residence. This conceptual theory shows that the level of knowledge and practice are related to each other in the depth of fire safety. However, the results of the range of knowledge and poor practice will lead to the conclusion that they need education on fire safety.

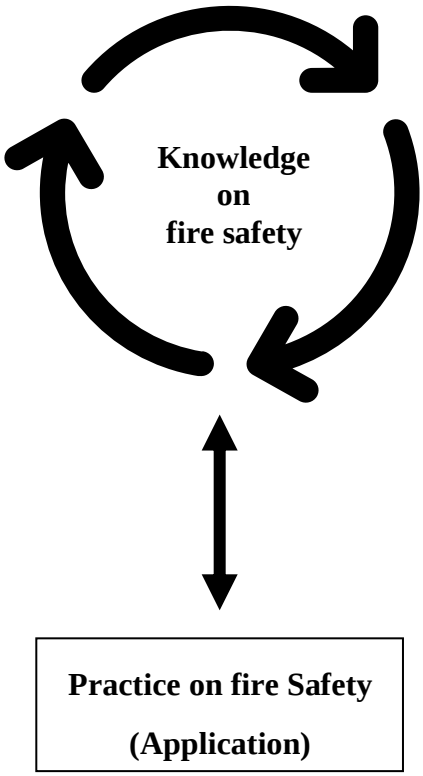

Figure 2.2 Conceptual framework adapted from Action to Knowledge Framework

CHAPTER 3: METHODOLOGY

The purpose of chapter three is to describe the chosen research methodology in detail and rationally. The research design is appropriate to understand which helps determine the direction of the research made according to the set objectives.

3.1 Research Design

This study is a cross-sectional study which has been conducted during the academic year 2022/2023 among undergraduates of School of Health Sciences in Health Campus, USM. A cross-sectional study allows the researcher to do so allowing the researcher to collect a lot of data at a time quickly and effectively. Researchers can also compare many different variables at the same time. This study uses the questionnaire of survey form (AlWaqfi et al., 2022).

3.2 Study Setting and Population

The study was conducted at the Health Campus, USM in Kelantan (Figure 3.1). This location was chosen as it is easy for me to become one of the subjects of my own research as it facilitates my data collection work in this study. This location was also inhabited by students from all year of study. This can avoid the occurrence of bias throughout the study. The study was conducted among the first year up to fourth year of School of Health Sciences Undergraduates in Health Campus, USM. The total number of undergraduates involved was 359 (Table 3.1). The duration of this study is up to ten months, from October 2022 until July 2023. Participant data were obtained from Academic Office and the study data collected from google form questionnaire after

obtaining ethical approval from the Human Research Ethics Committee (HREC) of USM which was in March 2023.

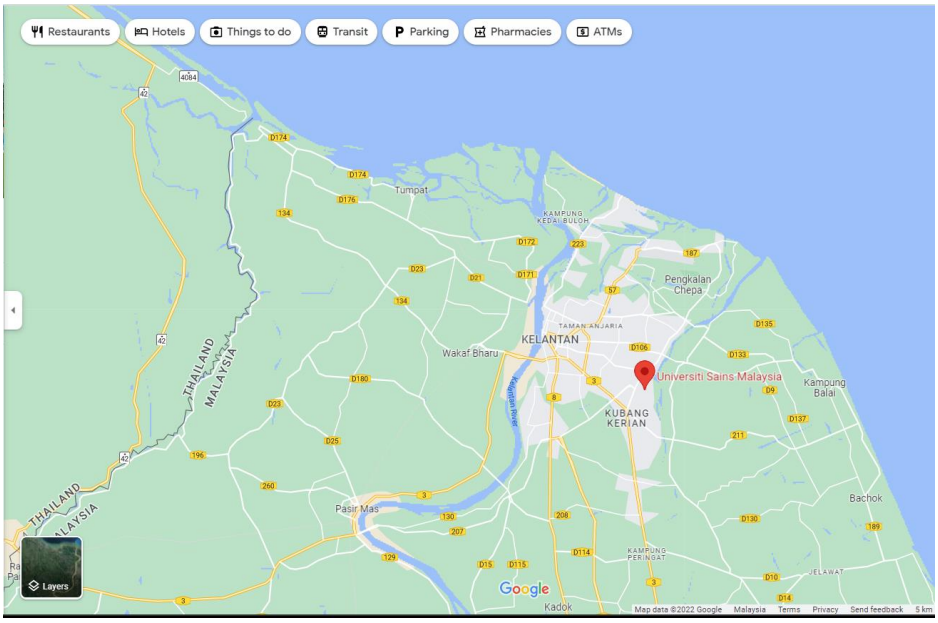

Figure 3.1 Health Campus, Universiti Sains Malaysia (Google Map Data, 2022)

Table 3.1 Total number of undergraduates in each program

Program	Total number as undergraduate
Audiology	18
Biomedicine	27
Dietetics	52
Environmental & Occupational Health	30
Exercise & Sports Science	31
Forensic Science	32
Medical Radiation	41
Bachelors in Nursing	55
Diploma in Nursing	50
Nutrition	13
Speech Pathology	10
TOTAL	**359**

3.3 Sampling Plan

3.3.1 Sample Criteria

3.3.1.1 Inclusion Criteria

i. Undergraduates from all programs of School of Health Sciences at Health Campus, USM

ii. First year until fourth year

3.3.1.2 Exclusion Criteria

i. Student who stays outside of campus hostel

3.3.2 Sample Size Estimation

The sample size for each objective was calculated. This study is determined by the sample size that was suitable for available population of School of Health Sciences in Health Campus, USM. This study used a single proportion formula and two proportion formula to calculate the sample size based on the objectives below.

3.3.2.1 First Objective: To assess the level of knowledge on fire safety among undergraduates of School of Health Sciences in Health Campus, USM.

Based on previous study by Musigapong & Phanprasit (2013), a single proportion formula was used to calculate sample size for first objective. 26.4% of participants had good knowledge on fire safety from that previous study.

$$n = \left(\frac{z}{\Delta}\right)^2 p(1-p)$$

Whereby,

n = required sample size

z = value represented the desired confidence level (1.96)

Δ = desired level of precision/margin error (± 5%)

p = anticipated population proportion (0.264) (Musigapong & Phanprasit, 2013)

Calculation:

$$n = \left(\frac{1.96}{0.05}\right)^2 0.264(1 - 0.264)$$

$n = 299$

The minimal sample size is 299, and after considering a 20% drop out, the sample size calculated is:

$$\text{n} = 299 + 20\%$$

$$n = 299 + 60$$

$$n = 359 \text{ participants}$$

Hence, the sample size required for the first objective in this study was 359 participants. As a reminder, all the sample sizes fulfill the inclusion and exclusion criteria.

3.3.2.2 Second Objective: To assess the level of practices on fire safety among undergraduates of School of Health Sciences in Health Campus, USM.

Based on previous study by Musigapong & Phanprasit (2013), a single proportion formula was used to calculate sample size for second objective. 22.2% of participants had good practices on fire safety from that previous study.

$$n = \left(\frac{z}{\Delta}\right)^2 p(1-p)$$

Whereby,

n = required sample size

z = value represented the desired confidence level (1.96)

Δ = desired level of precision/margin error (± 5%)

p = anticipated population proportion (0.264) (Musigapong & Phanprasit, 2013)

Calculation:

$$n = \left(\frac{1.96}{0.05}\right)^2 0.222(1-0.222)$$

$n = 265$

The minimal sample size is 265, and after considering a 20% drop out, the sample size calculated is:

$$\text{n} = 265 + 20\%$$

$$n = 265 + 53$$

$$n = 318 \text{ participants}$$

Hence, the sample size required for the second objective in this study was 318 participants. As a reminder, all the sample sizes fulfill the inclusion and exclusion criteria.

3.3.2.3 Third Objective: To identify the association between level of knowledge and practices on fire safety among undergraduates of School of Health Sciences in Health Campus, USM.

By using the two-proportion formula from Wang, H. and Chow, S. C. (2007), the sample size is calculated as follows.

$$n = \frac{(z_\alpha + z_\beta)^2 \, [p_1(1-p_1) + p_2(1-p_2)]}{(p_1 - p_2)^2}$$

Whereby,

n = required sample size

z_α = desired confidence level for each tail for two-sided alternative (1.96 for α=0.05)

z_β= power of study/critical value (0.84 for power=80%)

p_1 = estimated proportion for good knowledge (6%) (AlWaqfi et al., 2022)

p_2 = estimated proportion for poor knowledge (38%) (AlWaqfi et al., 2022)

$(p_1 - p_2)^2/d^2$=desired precision

Calculation:

$$\text{n} = \frac{(1.96 + 0.84)^2 \, [0.06(1-0.06) + 0.38(1-0.38)]}{(0.06 - 0.38)^2}$$

$$\text{n} = 22.3 \sim 22 \text{ participants for every group}$$

The minimal sample size is 22, and after considering a 20% drop out, the sample size calculated is:

$$n = 22 + 20\%$$

$$n = 22 + 4$$

$$n = 26 \, participants \, per \, group$$

Hence, the sample size required for the third objective in this study was 26 participants. As a reminder, all the sample sizes fulfill the inclusion and exclusion criteria.

Based on the estimated sample size, the greatest sample size was selected as can meet the research objectives. 359 participants of undergraduates of School of Health Sciences in Health Campus, USM who fulfilled the exclusive criteria for research.

3.3.3 Sampling Method

Throughout this study, respondents were randomly selected using a stratified sampling method. Stratified random sampling is a sampling method that involves dividing the population into smaller subgroups (Hayes, 2022). This type of sampling allows researchers to obtain a sample population that is most representative of the entire population under study to ensure that each subgroup (program of study in School of Health Sciences) of interest is represented. Each participant has an equal and independent chance to be selected for research purposes. There is no possibility of bias issues as it ensures the expansion of the sample to the entire population.

There were eleven programs included in this study including Audiology, Biomedicine, Dietetics, Environmental & Occupational Health, Exercise & Sports Science, Forensic Science, Medical Radiation, Bachelors in nursing, Diploma in Nursing. Nutrition and Speech Pathology. Hence, all the School of Health Sciences programs from each year of study participated in this study.

3.4 Instrumentation

A set of questionnaires was used to obtain study data on the level of knowledge and practices among undergraduates of School of Health Sciences in Health Campus, USM. Permission to use this questionnaire was obtained from the original author (Appendix B).

3.4.1 Instrument

This study was used the questionnaire which consists of two sections which includes knowledge and practices on fire safety.

3.4.1.2 Section A: Knowledge on Fire Safety

A total of 13 items on knowledge used in the questionnaire were adapted from the previous study (AlWaqfi et al., 2022). Each question is provided with true/false/do not know answers option and scored as follows;