KNOWLEDGE AND ATTITUDE TOWARDS CONTRACEPTION AMONG UNDERGRADUATE STUDENTS SCHOOL OF HEALTH SCIENCES, UNIVERSITI SAINS MALAYSIA

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by

NORZIANAH MOHD IMRAN

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CERTIFICATE

I certified that the dissertation entitled “Knowledge and Attitude Towards Contraception Among Undergraduate Students at School of Health Sciences, Universiti Sains Malaysia (USM)”. is a bona fide record of research work done by Norzianah Mohd Imran during the period from October 2023 to August 2024 under my supervision. Accordingly, I have read this dissertation, which, in my opinion, conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfilment for the degree of Bachelor of Nursing (Honours).

DECLARATION

I hereby declare that this dissertation entitled “Knowledge and Attitude Towards Contraception Among Undergraduate Students at School of Health Sciences, Universiti Sains Malaysia (USM)” is the result of my study and 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. Finally, I grant Universiti Sains Malaysia the right to use the dissertation for teaching, research, and promotional purposes.

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LIST OF ABBREVIATIONS

APEX	-	Accelerated Programme for Excellence
AIDS	-	Acquired Immune Deficiency Syndrom
CDC	-	Centers for Disease Control and Prevention
HIV	-	Human Immunodeficiency Virus
HPV	-	Health Promotion Model
STIs	-	Sexually Transmitted Infections
UNFPA	-	United Nations Population Fund
USM	-	Universiti Sains Malaysia
WHO	-	World Health Organization

PENGETAHUAN DAN SIKAP TERHADAP KONTRASEPSI DALAM KALANGAN PELAJAR SARJANA MUDA DI PUSAT PENGAJIAN SAINS KESIHATAN, UNIVERSITI SAINS MALAYSIA

ABSTRAK

Kontraseptif digunakan secara meluas untuk mencegah kehamilan yang tidak dirancang, pengguguran yang tidak selamat dan jangkitan seksual (STI). Walaupun terdapat kesedaran tentang penggunaan kontraseptif, golongan muda masih tidak mempunyai pengetahuan yang mencukupi mengenai penggunaannya. Kajian ini bertujuan untuk menilai tahap pengetahuan dan sikap terhadap kontraseptif dalam kalangan pelajar sarjana muda di Pusat Pengajian Sains Kesihatan, Universiti Sains Malaysia (USM). Kajian keratan rentas telah dijalankan dari 1 Januari 2024 hingga 28 Februari 2024 di Pusat Pengajian Sains Kesihatan, USM. Seramai 214 pelajar sarjana muda telah dipilih melalui kaedah persampelan rawak berstrata dan mudah. Soal selidik yang telah diuji terlebih dahulu digunakan untuk menilai ciri-ciri demografi peserta, tahap pengetahuan dan sikap terhadap kontrasepsi. Analisis deskriptif dan ujian Pearson chi-square digunakan untuk menganalisis data. Kajian ini mendapati majoriti peserta adalah Melayu (76.7%), perempuan (76.6%), dan daripada keluarga nuklear (73.8%), lebih separuh tinggal di kawasan bandar (58.4%), mempunyai tahap pengetahuan yang sederhana (47.2%). dan tahap sikap yang sederhana (47.7%) terhadap kontraseptif. Jantina (p=0.001) dan tahun pengajian (p=0.028) berkait dengan tahap pengetahuan terhadap kontrasepsi. Terdapat hubungan yang signifikan antara tahun pengajian (p=0.001) dan kawasan tempat tinggal (p=0.001) dengan tahap sikap. Tahap pengetahuan dikaitkan secara signifikan dengan tahap sikap (p=0.008). Kajian ini menunjukkan terdapat keperluan untuk meningkatkan dan memperhalusi pemahaman dan pandangan

pelajar tentang kontrasepsi, memastikan mereka memiliki pengetahuan yang lebih tinggi dan sikap yang lebih menyokong terhadap kontrasepsi.

KNOWLEDGE AND ATTITUDE TOWARDS CONTRACEPTION AMONG UNDERGRADUATE STUDENTS AT SCHOOL OF HEALTH SCIENCES, UNIVERSITI SAINS MALAYSIA

ABSTRACT

Contraception is widely used to prevent unplanned pregnancies, unsafe abortions and sexually transmitted infections (STIs). Despite awareness about contraception usage, young adults lack adequate knowledge regarding its usage. This study aimed to assess the level of knowledge and attitudes towards contraception among undergraduate students at the School of Health Sciences, Universiti Sains Malaysia (USM). A cross-sectional study was conducted from 1st January 2024 to 28th February 2024 at the School of Health Sciences, USM. A total of 214 undergraduate students were recruited via a stratified and simple random sampling method. A pre-tested questionnaire was used to assess participant demographic characteristics, knowledge levels and attitudes towards contraception. Descriptive analysis and Pearson chi-square test were used to analyze data. This study found that the majority of participants were Malay (76.7%), female (76.6%), and from nuclear families (73.8%), with over half living in urban areas (58.4%) and had moderate knowledge (47.2%) and attitude (47.7%) towards contraception. Gender (p=0.001) and year of study (*p*=0.028) were associated with knowledge level towards contraception. A significant association was found between year of study (*p*=0.001) and area of residence (*p*=0.001) with attitude level. Knowledge level was significantly associated with attitude level (*p*=0.008). This study indicates a need to elevate and refine students' understanding and outlook on contraception, ensuring they possess greater knowledge and a more supportive stance towards contraception.

CHAPTER 1
INTRODUCTION

1.1 Introduction

Unplanned pregnancy is a significant public health issue, leading to unsafe abortions and maternal morbidity in developing and developed nations (Muntinta, 2022; Sedgh, *et al*., 2021). In Malaysia, unwanted and unplanned pregnancies led to 900 cases of baby dumping were reported between 2010 and 2019 (Ali, 2019). Contraception is a global issue, with numerous unintended pregnancies reported annually, making it a significant problem in society (Elkalmi, *et al*., 2015). This thesis presents a cross-sectional study assessing the knowledge and attitudes towards contraception among undergraduate students at the School of Health Sciences, Universiti Sains Malaysia (USM), which is crucial for public health.

1.2 Background of the Study

Contraceptive methods are widely used to prevent unplanned pregnancies, unsafe abortions and sexually transmitted infections (STIs). However, unwanted births among higher education students pose a significant public health issue, affecting academic progress and future employment opportunities (Kara, *et al.*, 2019). The United Nations Population Fund (UNFPA) reports that abortions account for over 60% of unplanned pregnancies, with 45% of unsafe abortions resulting in 5-13% of maternal deaths, impacting the world's Sustainable Development Goals. Malaysia's Federation of Reproductive Health Associations Malaysia (FRHAM) reports 90,000 abortions annually, with 240 clinics nationwide offering services nationwide. Recent studies have indicated that unwanted pregnancy and unsafe abortion are prevalent due to a lack of understanding and negative attitudes towards contraception, leading to unplanned pregnancies with

psychological and socio-economic consequences, significantly impacting a woman's life (Kang, Chua & Ponnupillai, 2021; Yuan, *et al*., 2022).

Another major global problem is STIs, with over 1 million STIs acquired every day, the majority of which are asymptomatic. In 2021, more than 2.5 million cases of chlamydia, gonorrhoea and syphilis were reported by the Centers for Disease Control and Prevention (CDC, 2021). Meanwhile, Malaysia had 3.4 thousand syphilis infections and 878 AIDS cases in 2021, with 2.69 new cases per 100,000 persons (Statista Research Department, 2023). Contraception not only protects against unplanned pregnancies but may also lower their chance of contracting STIs (Traeen & Fischer, 2022). As such, significant to public health, contraception knowledge and attitude should apply to university students who are assets and backbone of a nation.

1.3 Problem Statement

A report by the Guttmacher Institute (2022) mentioned that roughly 121 million unintended pregnancies occurred each year worldwide between 2015 to 2019, and 61% of these unintended pregnancies ended in abortion. Malaysia, a developing country with multiracial communities, still maintains a conservative view on sex-related issues (UK Government, 2022). The education system lacks a comprehensive sexual education program, with the human reproductive system taught as a science subject in secondary schools (Ali, 2019; Kaler, 2018). A 2015 survey revealed that 35% of Malaysian young women were unaware of the pregnancy, leading to an increase in abortions and abandoned babies (Kaler, 2018). According to the Women, Family and Community Development Minister Datuk Seri Nancy Shukri at Bernama, Malaysia undoubtedly faces a severe and chronic problem with baby dumping, and this has been an ongoing social issue for several years. The national statistics show 256 babies found abandoned from 2020 to 2022

(Bernama, 2023).

University students in Malaysia are mostly between the ages of 19 and 24, are classified as youths, and are typically sexually active (Kang, Chua & Ponnupillai, 2021). In Malaysia, studies on contraceptive knowledge and attitudes among university students are relatively limited. This study aimed to assess the knowledge and attitudes towards contraception among undergraduate students in the School of Health Sciences, Universiti Sains Malaysia (USM). Hence, to inform this research study, the Health Promotion Model (HPM) developed by Nola Pender in 1982 was applied as the conceptual framework guiding this study to understand the relationship that motivates people to take positive health actions and the desire to avoid negative health consequences.

1.4 Research Questions

Generating research questions is important as the research question gives focus, sets boundaries, and provides direction (Polit & Beck, 2020). For this study, the following research questions served as a guide to achieving the research study's objectives. The research questions are as follows:

i. What are the knowledge levels of contraception among undergraduate students in the School of Health Science, Universiti Sains Malaysia (USM)?
ii. What are the attitudes levels of contraception among undergraduate students in the School of Health Science, USM?
iii. Is there any association between the selected demographic variables (age, gender, ethnicity, program of study, year of study, types of family, area of residence) with knowledge towards contraception among undergraduate students in the School of Health Science, USM?
iv. Is there any association between the selected demographic variables (age, gender,

ethnicity, program of study, year of study, types of family, area of residence) with attitudes towards contraception among undergraduate students in the School of Health Science, USM?

v. Is there any association between knowledge and attitude towards contraception among undergraduate students in the School of Health Sciences, USM?

1.5 Research Objectives

Research objectives concisely describe what the research aims to achieve (Polit & Beck, 2020).

1.5.1 General Objective

The general objective of this study was to assess the knowledge and attitude levels towards contraception among undergraduate students in the School of Health Sciences, USM.

1.5.2 Specific Objectives

i. To assess the knowledge levels of contraception among undergraduate students in the School of Health Science, USM.

ii. To assess the attitudes levels of contraception among undergraduate students in the School of Health Science, USM.

iii. To assess the association between the selected demographic variables (age, gender, ethnicity, program of study, year of study, types of family, area of residence) with knowledge towards contraception among undergraduate students in the School of Health Science, USM.

iv. To assess the association between the selected demographic variables (age, gender, ethnicity, program of study, year of study, types of family, area of residence) with attitudes towards contraception among undergraduate students in the School of Health Science, USM.

v. To assess the association between knowledge and attitude towards contraception among undergraduate students in the School of Health Sciences, USM.

1.6 Research Hypotheses

A research hypothesis is a statement of expectation or prediction that the research test (Polit & Beck, 2020). Following are the alternative and null research hypotheses of this study:

Hypothesis 1	:	There is a significant association between the selected demographic characteristics (age, gender, ethnicity, program of study, year of study, types of family, and area of residence) and knowledge levels towards contraception among undergraduate students in the School of Health Sciences, USM (H_A).
	:	There is no significant association between the selected demographic characteristics (age, gender, ethnicity, program of study, year of study, types of family, and area of residence) and knowledge levels towards contraception among undergraduate students in the School of Health Sciences, USM (H_O).
Hypothesis 2	:	There is a significant association between the selected demographic characteristics (age, gender, ethnicity, program of study, year of study, types of family, area of residence) and attitude levels towards contraception among undergraduate students in the School of Health Sciences, USM (H_A).
	:	There is no significant association between the selected demographic characteristics (age, gender, ethnicity, program of study, year of study, types of family, area of residence) and

		attitude levels towards contraception among undergraduate students in the School of Health Sciences, USM (H_O).
Hypothesis 3	:	There is a significant association between knowledge and attitude towards contraception among undergraduate students in the School of Health Sciences, USM (H_A).
	:	There is no significant association between knowledge and attitude towards contraception among undergraduate students in the School of Health Sciences, USM (H_O).

1.7 Significance of the Study

Knowledge of contraception is important and is a key factor for a better-balanced and rewarding life. Lack of awareness and knowledge continue to exist for adolescents and young adults when it comes to contraception as a study in the United States of America shows that contraceptive knowledge deficits continue to exist for adolescents and young adults (Sharma, *et al.*, 2021). Another recent study in Malaysia indicated that female university students had poor knowledge of contraceptive uses (Kang, Chua & Ponnupillai, 2021). Studies on knowledge of contraception are still scarce in Malaysia. In fact, University students in Malaysia are mainly between 19 to 24 years old, which has been categorized as youths and are usually sexually active (Kang, Chua & Ponnupillai, 2021). Furthermore, this study provides a chance for healthcare providers and government to use it as a reference to develop more effective campaigns or protocols for community health education about contraception. Therefore, this proposed study will assess undergraduate students' knowledge and attitudes towards contraception.

1.8 Conceptual and Operational Definitions

The following conceptual and operational definitions specific to this research study are as follows:

Term	Conceptual Definition	Operational Definitions
Contraception	Cambridge Dictionary (2023) defined contraception as the intentional use of any method to prevent pregnancy. According to Bansode, Sarao & Cooper (2023), contraception is also known as birth control.	In this study, contraception is the act of preventing pregnancy, and it can be a device, a medication, a procedure or a behaviour (WHO, 2023).
Knowledge	Knowledge was defined as the state of awareness of contraceptive methods, any specific types and the source of contraceptives. Knowledge refers to the facts, information and skills acquired through experience or education. (Nsubuga, *et al*., 2016). According to the Cambridge Dictionary (2023), knowledge of contraception is defined as the information, understanding and skills related to	This study refers to the knowledge of contraception of undergraduate students assessed using the questionnaire adopted from Ko Latt (2021) with permission. It consisted of 10 statements with "True" and "False" response choices. The sum of the responses represents the total score of knowledge of contraception and ranges between 0 and 10. One mark was awarded to each correct response, and zero points were given to each wrong response. The total marks obtained were

	contraception that an individual obtains through education or experiences.	converted into a percentage mark from a raw mark using the following formula: (raw mark x 100)/10. The level of knowledge was categorized into good (80%-100%), moderate (60%-79%), and poor (59% and less) knowledge based on the modified Bloom's cut-off point criteria.
Attitudes	Cambridge Dictionary (2023) defined attitude as the learned, enduring and affective evaluation of an object that exerts a directive impact on social behaviours. The attitude was defined as the participant's opinion or view, whether positive or negative, towards a practice or behaviour such as contraceptive use. (Nsubuga, *et al.,* 2016).	This study refers to the undergraduate students' attitudes towards contraception using a questionnaire from Ko Latt (2021), with permission (Appendix A). It consisted of 10 statements using a 5-point Likert scale where "strongly disagree" receives a score of 1 and "strongly agree" receives a score of 5. The total score was 50 points. The points obtained were converted into a percentage mark from a raw mark using the following formula: (raw mark x 100)/50. The level of attitude was categorized into good (80%-100%), moderate (60%-79%), and poor (59% and less) attitude based on

		the modified Bloom's cut-off point criteria.
Undergraduate student	A student studying for their first degree at a university (Cambridge Dictionary, 2023).	This study refers to students studying for their first degree from Environmental and Occupational Health, Forensic Science, Dietetics, Audiology, Speech Pathology, Biomedicine, Medical Radiation, Nutrition, Exercise and Sports Science) program at the School of Health Sciences, USM.
Nuclear family	A family consisting of two parents and their children. (Cambridge Dictionary, 2023).	In this study, it refers to the undergraduates' students from School of Health Sciences, USM with similar inclusion criteria who participate in this study that lived with their parents and their siblings.
Extended family	A family unit that includes grandmothers, grandfathers, aunts, and uncles, parents and children (Cambridge Dictionary, 2023).	In this study, it refers to the undergraduates' students from School of Health Sciences, USM with similar inclusion criteria who participate in this study that lived with their parents, siblings, grandmothers, grandfather, aunts and uncles.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

Chapter 2 details the literature review on scholarly articles and other sources relevant to the research being investigated. A combination of keywords used to search these articles includes contraception, knowledge, attitudes, undergraduate students, unplanned pregnancy and Malaysia. The literature review of this chapter was depicted into various sub-headings, namely contraception, knowledge of contraception, attitudes of contraception and the association of knowledge and attitudes towards demographic characteristics and the study's conceptual framework underpinning the research study.

2.2 Contraception

Contraception, a practice of preventing pregnancy, is a method used to control reproductive health and actively participate in family planning (Bansode, *et al.*, 2023). It includes various forms like oral contraceptives, implants, injectables, patches, vaginal rings, intrauterine devices, condoms and sterilization, lactational amenorrhea methods, withdrawal and fertility awareness-based methods (WHO, 2023). Effective contraception reduces unplanned pregnancies and abortions, promoting family planning (Bansode, *et al.*, 2023). According to the CDC (2023), the use of condoms can lower HIV (human immunodeficiency virus) infection and other STI risks, as well as prevent pregnancy. Although contraception comes in various forms, not all of them are appropriate for all situations. The most effective method of birth control is determined by an individual's overall health, age, sexual activity frequency, number of sexual partners, desire to have children in the future and family history of specific disorders (WHO, 2023). Thus, counselling should evaluate efficiency, safety, acceptability, and availability, including

accessibility and affordability, when deciding on contraceptive methods. Voluntary participation in the selection of methods of contraception is a key guiding concept. As a result, this will contribute to the successful use of contraceptive methods when combined with contraceptive counselling.

Between 2000 and 2020, World Family Planning reported a significant increase in women using modern contraceptive methods from 663 million to 851 million, while traditional methods remained around 85 million. The modern contraceptive method is identified as a product or medical procedure that interferes with reproduction after sexual intercourse, while traditional methods lactational amenorrhea method, withdrawal method, calendar method, cervical mucus method and abstinence (Hubacher & Trussell, 2015; Rabiu & Rufa'i, 2018). The proportion of reproductive-age women using contraception has increased globally, particularly in regions with limited contraceptive use in the past. United Nations Department of Economic & Social Affairs, Population Division (2020) mentioned Malaysia's Contraceptive Prevalence Rate (CPR) has stagnated at 52.2% between 1984 and 2014, making it one of the lowest in Southeast Asia. It is also off track in reducing high unmet needs for modern contraceptives at 17.6% (Theo, *et al*, 2021).

2.3 Knowledge of Contraception among Undergraduate Students

A study among second and third year of undergraduate's university in the Western Provice of Sri Lanka found that 52.9% of them had poor knowledge on condom (Perera, & Abeysena,, 2019). The results from study in Saudi Arabia showed 51.1% among women aged 15-35 from lower educational levels believed that Oral Contraceptives Pills (OCPs) can protect against STIs (Alshardan, *et al.*, 2020).

A cross-sectional study among women aged 18-49 in Senawang Health Clinic, Malaysia, showed that 60.95% have poor knowledge of contraception, while only 39% have good knowledge. 96.8% of respondents have heard of available contraceptive methods (Nachimuthu, 2022). Another recent cross-sectional study conducted at the Universiti Kebangsaan Malaysia revealed that contraception knowledge was low among unmarried young adults aged 18-35 years in Malaysia, with a mean total knowledge score of 4.76±2.90 (maximum knowledge score of 12). Only 25.1% of participants correctly answered the question, "Women using Depo must get injected every three months" (Kang, Chua & Ponnupillai, 2021). A cross-sectional study by Fatimah, *et al.* (2019) found that 67.2% of Malaysian university students knew about contraception, but only 52% correctly answered about safe sex during infertile periods. Hence, suggests gaps in contraception education and awareness and calls for improved efforts to address these issues.

2.4 Attitudes towards Contraception among Undergraduate Students

A descriptive cross-sectional study in Nigeria found that 57.3% of female college students aged 15-29 years old have negative attitudes towards contraception. 55.2% of the respondents felt that contraceptives are ineffective and 53.4% felt they encourage promiscuity (Amu, *et al.*, 2020). Bekele, *et al.* (2020) reveals that 52.3% of women in emerging regions of Ethiopia had favorable attitude towards contraception with older women aged 25-49 had more favorable attitudes than women from the lowest age sector 15-24 years. A study in Tanzania found differing religious beliefs were among the reasons reported by female undergraduates' university students for not using contraception (Kara, *et al.*, 2019). Another study reveals medical interns at one of the hospitals in India were 100% agreed that contraceptive information should be only for married couples (Usha, *et al*., 2023).

A cross-sectional study from Suen Wei Kay (2020) found that attitude of the undergraduates' students in Private University Kajang in Malaysia on contraception were only at the satisfactory level. The finding showed 50.6% of students had a good attitude and almost half of the students 49.4% had poor attitudes towards contraception. Ko Lat, *et al.* (2021) found that half of the respondents (51.5%) had moderate attitude towards contraception among medical students in University Kuala Lumpur, Malaysia with 53.84% of participants agreed that cultural beliefs was preventing women from using contraceptives.

2.5 Association Between Demographic Characteristics with Knowledge and Attitudes of Contraception

A study in Arab Saudia reveals that urban women with good knowledge about contraception and low monthly income females are more likely to have positive attitudes towards contraceptive methods, indicating a significant association between demographic characteristics and knowledge and attitudes towards contraception (Alkalash, *et al.,* 2023).

A cross-sectional study among Muslim women aged 15-49 years in Nepal reveals the knowledge of modern contraceptive methods was influenced by several socioeconomic factors, such as family type, with 72.5% of respondents from an extended family having good knowledge of modern contraceptive methods (Thakuri, *et al*., 2022).

Hanif Zulfakar, *et al.* (2023) study among unmarried adults aged 18-35 in Malaysia found that older respondents had higher contraception knowledge and positive attitudes. Additionally, participants from other ethnicities had higher knowledge and positive attitudes than Malay, Chinese and Indians. A study by Gasaba, *et al*. found that women aged 18 to 49 years often avoid contraceptive methods due to religious beliefs,

fear, mass media exposure, lack of knowledge, ignorance and age. However, the majority of participants knew the importance of contraceptives to prevent unwanted pregnancies and were aware of the consequences of nonuse (Gasaba, *et al.,* 2021).

A study at Universiti Putra Malaysia revealed that 59.2% of medical students have a negative attitude towards contraception, with a significant association between place of birth, ethnicity and marital status (Ma Saung Oo, *et al.*, 2019).

Ko Latt, *et al.* (2021) study found a significant association between gender and knowledge of contraception, with female students having more than twice the change in knowledge compared to male students. The study also found a significant association between the year of study and knowledge and attitudes towards contraception, with knowledge increasing with study duration.

A cross-sectional study in Malaysia found that Chinese individuals had a higher level of knowledge about contraception compared to Indians (42.1%) and Malays (38.5). Indians had a more positive attitude towards contraception (63.3%), followed by Chinese (57.1%) and Malay (33.7%) (Ma Saung Oo, *et al.,* 2019). However, there is a lack of research on the association between ethnicity and contraception knowledge and attitude.

Fatimah, *et al.* (2019) found that science faculty students had better knowledge of contraceptives compared to non-science faculty students. A study in Sri Lanka revealed that Bioscience students had the highest knowledge, followed by Art, Mathematics, and Commerce students. However, these streams had a high negative attitude towards contraception (Kuruppuarachchi, *et al.,* 2023)

A cross-sectional study in Vietnam found that medical students in Years 1, 2, and

3 scored less on contraceptive knowledge compared to Year 4, 5, and 6 students (Nguyen & Vo, 2018). A similar study in Bosnia and Herzegovina found that Year 5 and 6 students had better attitudes towards contraception compared to Year 1 and 2 students (Kajic, *et al*., 2015).

2.6 Association between Knowledge and Attitudes Towards Contraception

Contraception use is influenced by the perceived likelihood and appeal of pregnancy, relationship status, women's knowledge, beliefs, and perceptions of side effects and health concerns (D'Souza, *et al.*, 2022).

A study among Malaysian medical students at a private medical university found that despite their good knowledge of contraception, their attitudes towards it are not always aligned with their knowledge. Less than half (39.24%) believed it was better to advise sexually active unmarried adolescents to abstain from sex when asked for contraceptives. In comparison, 41.49% disagreed that providing contraceptives promotes sexual promiscuity and HIV/AIDS spread. Over half of the respondents believed cultural beliefs were preventing women from using contraceptives (Ko Latt, *et al.*, 2021).

Another study among Malaysian unmarried young adults reveals that participants with higher knowledge demonstrated a more positive attitude towards contraception (Hanif Zulfakar, *et al.*, 2023). Research in Korea among 134 students shows a significant correlation between contraceptive knowledge and contraceptive attitude with $p=0.037$ (Jnag & Hong, 2017).

2.7 Conceptual Framework for the Study

This study used the Health Promotion Model (HPM), developed by Nola Pender in 1982, to aid the researcher in understanding the students' health behaviour determinants for promoting positive health acts motivated by a desire to prevent detrimental health outcomes (Pender, *et al.,* 2011). The HPM focuses on conceptual (perceptual) factors, modifying factors and the likelihood of participation in health-promoting behaviours. Figure 2.1 illustrates the structure of Pender's Health Promotion Model.

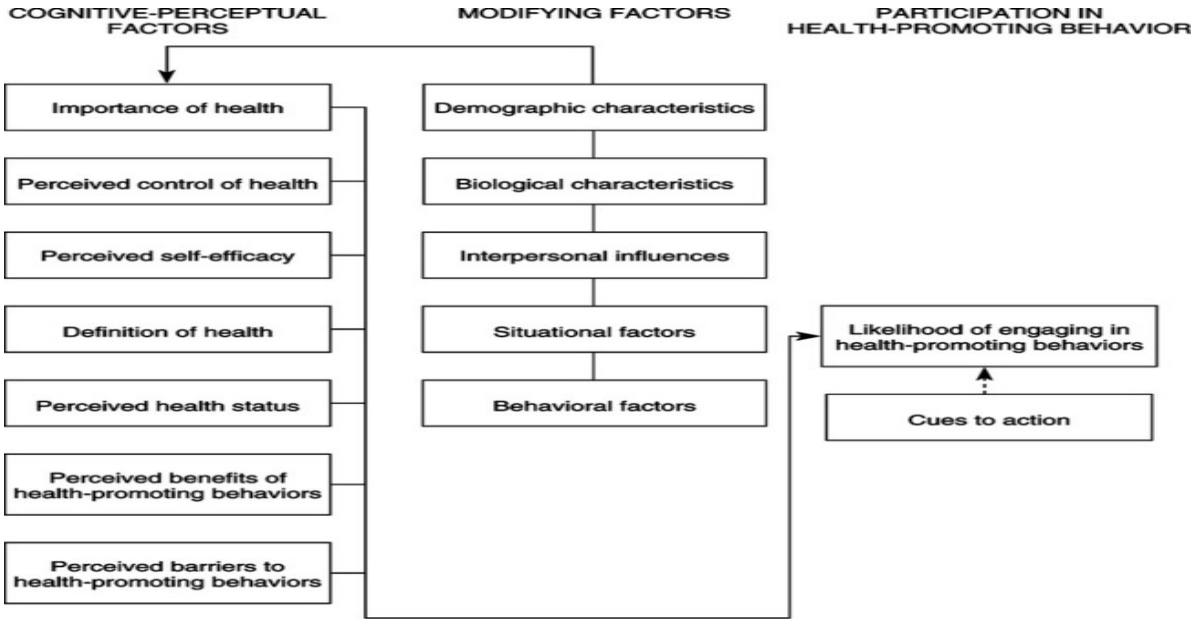

Figure 2.1 Pender's Health Promotion Model (1982)

Meanwhile, in this study, cognitive-perceptual factors refer to the undergraduate students' knowledge and attitude towards contraception. In this study, modifying factors refer to undergraduate students' demographic characteristics (age, gender, ethnicity, program of study, year of study, types of family, and area of residence). In the likelihood of action, the knowledge and attitude of contraception and modifying factors are directly related to the health promotion activity. Examining the variables in Pender's (1982) Health Promotion Model for their association with contraceptive knowledge and attitude may guide future interventions aimed at assisting youth to prevent unplanned pregnancy and delay subsequent pregnancy and the likelihood of students towards positive attitudes on reproductive health improvement.

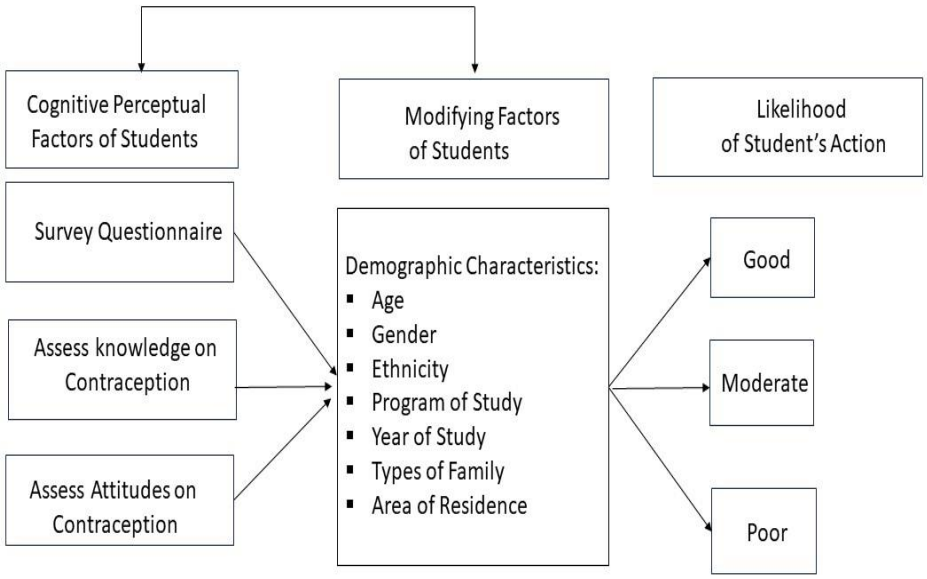

Figure 2.2 A Conceptual Framework Adopted from Pender's Health Promotion Model (1982)

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

Chapter 3 contains the research methodology for this study, the explanation of the approach and the rationale used to support the chosen research methodology. Determining and understanding an appropriate research design is essential for achieving the study's aims. Therefore, the chapter begins with a description of a cross-sectional design and justification for using this approach, followed by a description of the study setting, population, participant selection criteria, sampling plan, sample size determination, and instrumentation, including ethical considerations and data collection methods. The final section explains the analytical processes used with the quantitative data.

3.2 Research Design

A cross-sectional design was utilized to assess the knowledge and attitude levels towards contraception among undergraduate students in the School of Health Sciences, USM. The justification and rationale were that in a cross-sectional study, data was collected on the whole study population at a single point to examine variables of interest, relatively cheap and can be conducted more quickly than other types of research (Polit & Beck, 2020).

3.3 Study Setting and Population

The School of Health Sciences, Universiti Sains Malaysia (USM) in Kelantan was the research location because of its designation as an Accelerated Programme for Excellence (APEX) in 2008. Undergraduate students enrolled at the School of Health Sciences, USM, were recruited as the target population for this study.

3.3.1 Inclusion Criteria

Specific eligibility requirements for inclusion in this study:

- Year 1, 2, 3 and 4 undergraduate students from the following programs: Environmental and Occupational Health, Forensic Science, Dietetics, Audiology, Speech Pathology, Biomedicine, Medical Radiation, Nutrition, Exercise and Sports Science.

3.3.2 Exclusion Criteria

i. Undergraduate nursing students. These students were excluded from the study because they have received knowledge content on reproductive health in the curriculum.

ii. Undergraduate students who are absent, on sick leave or feeling unwell and postponing study during the survey period.

3.4 Sampling Plan

Sampling is a process where researchers take a predetermined number of observations from a larger population (Polit & Beck, 2020).

3.4.1 Sampling Method

A stratified random sampling technique was used to select participants. The study used a random sampling technique to divide the sample into subpopulations, ensuring that the stratified random sampling accurately reflects the researched population, as the whole population was stratified beforehand. In short, it ensures each subgroup within the population receives proper representation within the sample (Polit & Beck, 2020). The technique was preferred because participants have an equal and fair chance of being selected. As the selection method used gives every participant a fair chance, the resulting sample had an unbiased representation of the population and was unaffected by the

researcher (Noor, *et al.*, 2022). Figure 3.1 illustrates the stratified random sampling.

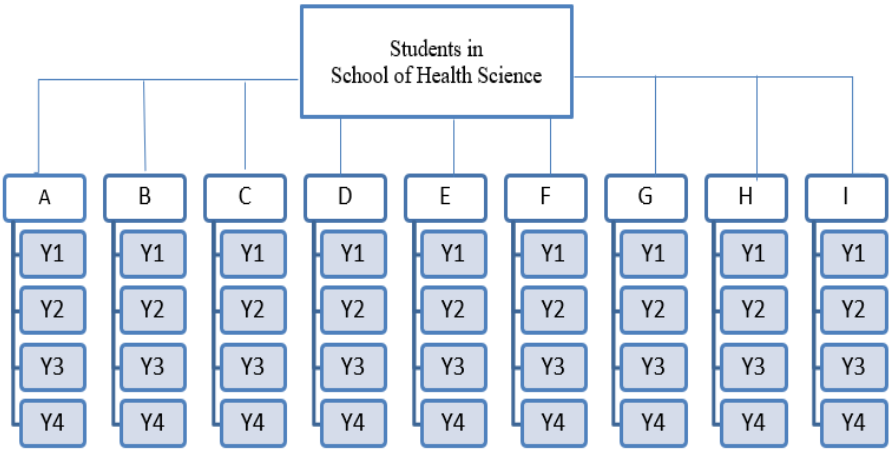

Figure 3.1 Stratified Random Sampling

3.4.2 Sampling Size Estimation

Consequential research requires an understanding of the statistics that drive sample size decisions. Calculating the sampling size for a study is important to ensure it represents the population. In addition, a large sample may lead to wasting time, money, and energy, whereas a small sample size tends to produce inaccurate results (Six Sigma, 2012). To establish the sample size, the sample size calculation was estimated based on the research objectives of this study

Objective One

For objective one, the estimated sample size for objective one was calculated using the formula of Krejcie and Morgan (1970) and based on the prevalence of 88.6% (Amu, *et al.*, 2020) on knowledge towards contraception among students in a public college:

$$S = \frac{X^2 NP\,(1-P)}{d^2(N-1) + X^2 P(1-P)}$$

S = Sample size required

X^2 = 3.841, for 0.95 confidence level

N = Population Size = 901

P = prevalence of previous study

d = Degree of accuracy = 0.05

$$S = \frac{(3.841)(901)(0.886)\ (1-0.886)}{(0.05)^2(901-1)+(3.841)(0.886)(1-0.886)}$$

S = 155.28803

S = 155

If n is the sample size required per formula and 10% is the dropout rate, then the adjusted sample size N is 172.

N = 155/ (1-0.1)

N = 172.22

N = 172

Therefore, for objective one, the total sample size is 172 students.

Objective Two

For objective two, the estimated sample size was calculated using the formula of Krejcie and Morgan (1970) and based on the prevalence of 82% (Marimirofa, *et al*., 2022) on attitudes towards contraception among students in a public university:

$$S = \frac{X^{\ 2}NP\ (1-P)}{d^2(N-1)+X^2P(1-P)}$$

$$S = \frac{(3.841)(901)(0.82)\ (1-0.82)}{(0.05)^2(901-1)+(3.841)(0.82)(1-0.82)}$$

S = 226.8816

S = 227

If n is the sample size required per formula and 10% is the dropout rate, then the adjusted sample size N is 252.

N = 227/ (1-0.1)

N = 252.22

N = 252

Therefore, for objective two, the total sample size is 252 students.

Objective 3

The estimated sample size for objective three was calculated using the two-proportion formula based on the Ko Latt, *et al.'s* (2021) study as follows:

$$n = \frac{p1(1 - p1) + p2(1 - p2)(z\alpha + z\beta)^2}{(P1 - P2)^2}$$

n = required sample size

z α = value of the standard normal distribution curve cutting off probability Alpha (α) in one tail for a one-sided alternative or $\alpha 2$ in each tail for a two-sided alternative (z 0.05=1.96)

zβ = Power of study, 80% (zβ = 0.84)

zα = 1.96

p = estimated proportion of an attribute that is present in the population

p1 = High knowledge female 70.1% (Ko Latt, *et al.,* 2021)

p2 = High knowledge male 54.5% (Ko Latt, *et al.,* 2021)

$$n = \frac{0.707(1 - 0.707) + 0.545(1 - 0.545)(1.96 + 0.84)^2}{(0.707 - 0.545)^2}$$

n= 81.9

n= 82

If n is the sample size required per formula and 10% is the dropout rate, then the

adjusted sample size N is 91.

N = 82/ (1-0.1)

N = 91.11

N = 91 samples from each group x 2

N = 182

Therefore, for objective three, the total sample size is 182 students.

Objective Four

The estimated sample size for objective four was calculated using the two-proportion formula study as follows

p1 = Good attitude male 68.5% (Abdul-Zahra, *et al.*, 2013)

p2 = Good attitude female 46.3% (Ko Latt, *et al*., 2021)

$$n = \frac{0.685(1 - 0.685) + 0.463(1 - 0.463)(1.96 + 0.84)^2}{(0.685 - 0.463)^2}$$

n= 43.9

n= 44

If n is the sample size required per formula and 10% is the dropout rate, then the adjusted sample size N is 49.

N = 44/ (1-0.1)

N = 48.88

N = 49 samples from each group x 2

N = 98

Therefore, for objective four, the total sample size is 98 students.

Objective Five

The estimated sample size for objective five was calculated using the single proportion formula based on Negash, *et al*. (2022), which is 10.7% (p=0.107) as follows:

$$n = \left[\frac{1.96}{0.02}\right]^2 0.107\ (1 - 0.107)$$

n = 147

If n is the sample size required per the formula and 10% is the dropout rate, then the adjusted sample size N is 163.

N= 147/1-0.1)

N=163

Therefore, for objective five, the total sample size is 163 students.

A larger sample than necessary will better represent the population and provide more accurate results (Polit & Beck, 2020). This research chooses a reasonable sample size from the largest sample size. Thus, 252 participants were taken as the study sample.

3.5 Instrumentation

Instrumentation is the use of work completed by planned instruments around the research topic (Polit & Beck, 2019).

3.5.1 Instrument

A self-administered questionnaire in English consisting of three parts (Part A, B & C) was utilized. Part A consists of a set of questions to collect the participants' socio-demographic data (age, gender, ethnicity, program of study, year of study, types of family and area of residence). Part B consists of 10 items that assessed the participants' knowledge towards contraception with two answer options (True/False). Each correct