KNOWLEDGE AND ATTITUDE OF POLYCYSTIC OVARY SYNDROME (PCOS) AMONG WOMEN WHO ATTEND THE OUTPATIENT CLINICS AT HOSPITAL UNIVERSITI SAINS MALAYSIA (USM)

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by

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Dissertation submitted in partial fulfilment of
the requirements for the degree of
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CERTIFICATE

This is to certify that the dissertation entitled "Knowledge and Attitude of Polycystic Ovary Syndrome (PCOS) Among Women Who Attend the Outpatient Clinics At Hospital Universiti Sains Malaysia (USM)" is the research work done by Ms "Siti Nur Zubaidah binti Zukiman" during the period from October 2023 until June 2024 under my supervision. I have read this dissertation, and, in my opinion, it conforms to acceptable standards of supervision 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 in Nursing with Honours.

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DECLARATION

I hereby declare that this dissertation is the result of my 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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LIST OF ABBREVIATION

PCOS	Polycystic Ovary Syndrome
USM	Universiti Sains Malaysia
HUSM	Hospital Universiti Sains Malaysia
HBM	Health Belief Model
KPP	Klinik Pakar Perubatan
KRK	Klinik Rawatan Keluarga
O&G	Obstetrics and Gynaecology
ENT	Ear Nose Throat
HREC	Human Research Ethical Committee

PENGETAHUAN DAN SIKAP TERHADAP SINDROM OVARI POLISISTIK (PCOS) DALAM KALANGAN WANITA YANG MENGHADIRI KLINIK PESAKIT LUAR DI HOSPITAL UNIVERSITI SAINS MALAYSIA

ABSTRAK

Sindrom ovari polisistik adalah merujuk kepada sindrom yang memberi kesan terhadap ovari dan kitaran ovulasi dalam kalangan wanita. Kajian ini bertujuan untuk mengukur pengetahuan dan tingkah laku terhadap PCOS dalam kalangan wanita yang hadir ke klinik pesakit luar di Hospital Universiti Sains Malaysia. Kajian keratan rentas telah dijalankan ke atas wanita berumur 18 hingga 60 tahun. Data dikumpul menggunakan soal selidik yang ditadbir sendiri. Seramai 165 wanita yang hadir ke klinik pesakit luar di Hospital Universiti Sains Malaysia yang memenuhi kriteria inklusi telah terlibat dalam kajian ini. Kajian ini menggunakan persampelan kemudahan. Data yang dikumpul dianalisis secara statistik menggunakan perisian SPSS versi 27. Data kajian dianalisa menggunakan statistik deskriptif dan Pearson Chi-square. Hasil kajian ini menunjukkan mempunyai tahap pengetahuan yang sederhana terhadap PCOS dan peserta juga menunjukkan tahap tingkah laku yang sederhana. Tidak terdapat perkaitan antara skor pengetahuan dan skor tingkah laku ($p = 0.093$), keputusan menunjukkan hanya 32 (47.1%) peserta yang mempunyai pengetahuan dan tingkah laku yang baik. Tiada perkaitan antara faktor sosiodemografi [umur ($p = 0.119$), status perkahwinan ($p = 0.774$), tahap pendidikan ($p = 0.228$), tahap pekerjaan ($p = 0.234$] dan tahap pengetahuan tentang PCOS. Kesimpulannya, tahap pengetahuan dan tingkah laku terhadap PCOS dalam kalangan wanita perlu dipertingkatkan dan ditambah baik agar mereka lebih berpengetahuan untuk meningkatkan kesedaran tentang PCOS dan turut membantu menyebarkan risiko-risiko dan komplikasi berkaitan penyakit PCOS.

KNOWLEDGE AND ATTITUDE OF POLYCYSTIC OVARY SYNDROME (PCOS) AMONG WOMEN WHO ATTEND THE OUTPATIENT CLINICS AT HOSPITAL UNIVERSITI SAINS MALAYSIA

ABSTRACT

Polycystic ovary syndrome (PCOS) is a common metabolic and endocrine disorder in females in their reproductive-age and is associated with some clinical complications. The study aims to assess the level of knowledge and the level of attitude on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM). A cross-sectional study was conducted on women aged 18 to 60 years old. Data was collected using a self-administered questionnaire. 165 women who fulfilled the inclusion criteria of this study was selected to answer the questionnaire. They were selected through convenience sampling method. Data collected were statistically analyzed using the SPSS software version 27. The study used descriptive statistics and Pearson Chi-square. The results show that 118(78.7%) of participants have a moderate level of knowledge on PCOS and 95(63.3%) of participants have moderate level of attitude on PCOS. There was no association between knowledge score and attitude score (p = 0.148), the result shows only 14(26.4%) of participants have good knowledge and positive attitude. Lastly, there was no association between sociodemographic factors [age (p = 0.222), marital status (p = 0.912), educational level (p = 0.743), occupational status (p = 0.442)] and the level of knowledge on PCOS. In conclusion, the level knowledge and attitude on PCOS among women must be enhanced and improved so that they are more knowledgeable regarding PCOS and it can help them to spread the risk and complication towards PCOS.

CHAPTER 1
INTRODUCTION

1.1 Background of The Study

Polycystic ovary syndrome (PCOS) is a common metabolic and endocrine disorder in females in their reproductive-age and is associated with some clinical complications (Abu-Taha et al., 2020). Polycystic ovarian syndrome, or PCOS, is multifaceted and difficult to define. PCOS is a 'syndrome' or classified as the symptoms that affect the ovaries and ovulation. PCOS has three major features including cysts in the ovaries, high levels of male hormone and uneven periods. The word "polycystic' means multiple cysts or many cysts that each one containing an immature egg. So that, ovulation cannot be triggered as the eggs never mature enough. The lack of ovulation will change the levels of estrogen, progesterone, luteinizing hormone (LH), and follicle stimulating hormone (FSH). There will be an increase in androgen levels while a decrease in estrogen and progesterone level (Hussin & Kadir, 2020).

The World Health Organization (WHO) estimates that in 2012, 116 million women (3.4%) globally suffered with PCOS. Estimates of PCOS prevalence vary widely worldwide, ranging from 2.2% to up to 26% (Vidya Bharathi et al., 2017). Meanwhile, in the United States, PCOS influences roughly 5 million women of reproductive age. Women with PCOS are at increased risk or complication of endometrial cancer, infertility, late menopause, and additionally metabolic abnormalities, including type 2 diabetes mellitus (DMT2), insulin resistance, dyslipidemia, and cardiovascular infection (Azziz et al., 2004). Then, in Europe, the global prevalence of PCOS varies from 5 to 18% with an average prevalence of 276.4 cases per 1000000 people. It shows that around 50% women

are not aware that they have PCOS, or they have a delayed diagnosis (The Lancet Regional Health – Europe, 2022).

According to Yang et al., (2022), the prevalence of PCOS in Chinese women has increased significantly over the past 10 years. In 2020, 826 participants could be diagnosed as having PCOS, with a weighted prevalence of 7.8% (95%CI: 7.0%, 9.0%) among women aged 20-49 years, leading to an estimate of 24.0 million women of reproductive age affected by this condition in China as a whole (Yang et al., 2022). Then, based on a cross-sectional study in Klang Valley, the finding revealed that 43 (10.49%) respondents had medical diagnosis of PCOS, 11 (2.68%) were diagnosed with PCOS based on signs and symptoms, and 135 (32.93%) were suspected with PCOS (Jia Ean Goh et al., 2022).

PCOS is a common condition that affects how a woman's ovary work. The three main features of PCOS includes irregular periods which means the ovaries does not regularly release the eggs or we called as ovulation. Next features are an excess androgen. People will having high level of "male" hormones in the body which may cause physical signs such as excess facial or hair body hair. Then, the other features are polycystic ovaries which means ovaries become enlarged and contain many fluid-filled sacs (follicles) that surround the eggs (NHS Choices, 2023).

The possible symptoms of PCOS include heavy, long, unpredictable, or absent periods. Then, PCOS can make people infertility. People also will have acne or oily skin and excessive hair on the face or body. Weigt gains especially around the belly also one symptom of the PCOS. People with PCOS are more likely have complication or health conditions including type 2 diabetes, hypertension, heart disease, high cholesterol, and endometrial cancer. PCOS can lead to anxiety, depression, and negative body image. All

of this can affect other life areas such as family, relationships, work, and involvement in the community (World Health Organization et al., 2023).

According to Ramakrishna Shabaraya, (2021), majority of the study participants are unaware regarding PCOS. The study showed that only 8.96% had good knowledge, whereas 33.37% had average knowledge and 45.66% has poor knowledge on PCOS(Ramakrishna Shabaraya, 2021). Then, a cross-sectional study among nursing students in a tertiary centre in South India, in view of knowledge on long term complications, 62 students (70.45%) were aware about metabolic syndrome, 51 students (57.95%) about hypertension, 50 participants (56.81%) about being prone for diabetes mellitus, 60 students (68.18%) about risk of endometrial cancer (Sasikala et al., 2021).

1.2 Problem Statement

Women with polycystic ovary syndrome (PCOS) sometimes experience issues getting to be pregnant which are infertile and have large amounts of androgen hormones. The effect of modernization and technological ascertainment reflects in daily life and lifestyle. Food consumption is increasingly concentrated on sugar, fast food, and soft drinks. Lack of exercise and consuming unhealthy eating habits will lead to PCOS as well (Rahman, Parvez, Sabur, & Ali, 2012). Polycystic ovary syndrome (PCOS) is an endocrine disorder that affects the women in childbearing age. It has been found that the affects around 15% to 20% of women in their reproductive age. Women with PCOS are at risk for some complication such as high cholesterol, infertility, type 2 diabetes, endometrial cancer, and heart disease. So, by increased awareness of girls and women about PCOS can help them to gain knowledge, detect the PCOS early, and prevent PCOS.

Accurate and proper knowledge is an important factor for early diagnosis of PCOS (Ramakrishna Shabaraya, 2021).

A study done by Ramakrishna Shabaraya, (2021) based on the demographic characteristics of the study participants, the highest percentage of knowledge on PCOS based on age group were young adults (48.66%) followed by the middle-aged adult (40.6%) and older adults (10.6%). Knowledge of the PCOS based on age group was assessed and was found that there was not much difference in knowledge level since al the participants had lack of knowledge but comparing among themselves, middle aged adults had better knowledge compared to young and older adults.

Then, a study that done by Goh et al., (2022) that aimed to determine the prevalence of PCOS, assess the knowledge of PCOS and health-related practices among women in Klang Valley, Malaysia. In 2020, the global prevalence of PCOS between 2.2 to 48%. Studies have shown a trend toward the increasing prevalence of PCOS since the late 1900s. Locally, a prevalence study at University Putra Malaysia (UPM) found that prevalence of PCOS among employees was 12.6%. A lot of studies on prevalence, knowledge, and health-related practices were conducted in many countries, but the data in Malaysia are still lacking. So that, the research on this objective to get data among women in Klang Valley, Malaysia (Goh et al., 2022).

According to the increasing prevalence towards PCOS, hence this study will conduct to assess the level of knowledge and level of attitude of PCOS among women who attend outpatient clinics in Hospital USM. Moreover, the data of PCOS in Malaysia still lacking. As the limited study regarding the knowledge and attitude of PCOS among women, this study willing to determine the level of knowledge, attitude and the association between demographic data characteristics and level of knowledge on PCOS.

1.3 Research Questions

1. What is the level of knowledge on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM)?

2. What is the level of attitude on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM)?

3. Is there any association between the level of knowledge and the level of attitude on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM)?

4. Is there any association between selected sociodemographic data (age, marital status, educational level, and occupational status) with the level of knowledge on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM)?

1.4 Research Objectives

1.4.1 General Objective

The aim of this study is to assess knowledge and attitude of polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM).

1.4.2 Specific Objectives

1. To assess the level of knowledge on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM).

2. To assess the level of attitude on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM).

3. To determine the association between the level of knowledge and the level of attitude on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM).

4. To determine the association between selected sociodemographic data (age, marital status, educational level, and occupational status) with the level of knowledge toward polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM).

1.5 Research Hypothesis

HYPOTHESIS 1

Null hypothesis; (H_0):

There is no significant association between the level of knowledge and the level of attitude on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM).

Alternative hypothesis; (H_A):

There is a significant association between the level of knowledge and the level of attitude on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM).

HYPOTHESIS 2

Null hypothesis; (H_0):

There is no significant association selected sociodemographic data (age, marital status, educational level, and occupational status) with the level of knowledge on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM).

Alternative hypothesis; (H_A):

There is a significant association between selected sociodemographic data (age, marital status, educational level, and occupational status) with the level of knowledge on polycystic ovary syndrome (PCOS) among women who attend the outpatient clinics in Hospital Universiti Sains Malaysia (USM).

1.6 Conceptual and Operational Definitions

Terms	Conceptual Definition	Operational Definition
Polycystic ovary syndrome	PCOS is a "syndrome," or classified as symptoms that affects the ovulation and ovaries. It consists of three major features which are cysts in the ovaries, uneven periods, and high levels of male hormones (Hussin & Kadir, 2020).	In this study, researchers will assess the level of knowledge and attitude regarding PCOS.
Knowledge	Understanding of information about a subject that you get by experience or study, either known by one person or by people generally (Cambridge University Press, 2020).	In this study, knowledge of PCOS among women who attend the clinics will be assessed using a self-administered questionnaire.
Attitude	A feeling or opinion about something or someone, or a way of behaving that is caused of this (Cambridge Dictionary, 2023). In this study, attitude of PCOS	In this study, attitude of PCOS among women who attend the clinics will be assessed using a self-administered questionnaire.

	among women who attend the clinics will be assessed using	
Women	An adult who lives and identifies as female though they may have been said to have a different sex at birth (Cambridge Dictionary, 2023)	In this study, it refers to women who attends the clinics in Hospital USM.

1.7 Significance of Study

Nowadays, polycystic ovary syndrome become common on women in all the country. Women may occasionally be unaware that they suffer from PCOS. Even though some women are aware of the characteristic symptoms and signs of PCOS, however they decide not to see a gynaecologist for an additional opinion. Finally, some women are unable to become pregnant after marriage because they are unaware that they are infertile. This happens because infertility is a consequence of PCOS that affects women's ability to become pregnant (Rahman, Parvez, Sabur, & Ali, 2012).

Therefore, in order to help women understand PCOS and treat it early to prevent severe consequences, knowledge and awareness campaigns are essential. Thus, this study to assess knowledge and attitude of polycystic ovary syndrome (PCOS) among women who attend the clinics in Hospital University Sains Malaysia (USM).

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This chapter will present a review of the literature related to knowledge and attitude of polycystic ovary syndrome (PCOS) among women who attend the clinic in Hospital Universiti Sains Malaysia. It also presents the association between selected demographic characteristics (age, marital status, educational level and occupational) and polycystic ovary syndrome (PCOS). Lastly, it describes the theoretical framework chosen for this study. Health Belief Model (HBM) will be guiding this study.

2.2 Polycystic Ovarian Syndrome

Polycystic ovary syndrome (PCOS) is of the endocrine disorder and prevalent metabolic in females in their reproductive age (Copp et al., 2017). Depending on the diagnostic criteria and ethnicity, it is a heterogeneous and multifactorial disorder that affects 12–21% of the female population (Zahra Behboodi Moghadam et al., 2018). PCOS is a heterogenous syndrome that is characterized by features of anovulation with symptoms of androgen excess (Colwell et al., 2010). When combined, these clinical signs and symptoms provide a spectrum of the condition, with some presenting mildly and others experiencing significant disruptions to their reproductive, endocrine, and metabolic processes (Balen, 2004). According to the Rotterdam criteria, a refined definition of PCOS was agreed on the presence of two out of three criteria including i) oligo or anovulation, ii) hyperandrogenism (clinical or biochemical), and iii) polycystic ovaries with the exclusion of another etiologist (Bart et al., 2012). PCOS is a hormonal disorder with a potential that lead to various diseases. PCOS also continues to be a

common cause of infertility among women (Anderson et al., 2003). It means that infertility results from the absence ovulation, the process that release a mature egg from the ovary every month. Majority of women do not realize they have PCOS until they have trouble getting pregnant (Evanthia Diamanti-Kandarakis et al., 2001).

PCOS has many signs and symptoms that women should take seriously and know about their symptoms. Firstly, women with PCOS frequently have irregular or missed periods because of anovulation. Menstrual disturbances commonly observed in PCOS include amenorrhea, oligomenorrhea, and prolonged erratic menstrual bleeding (Ingudomnukul et al., 2007). Then, PCOS also can cause weight gain and fatigue. Some reported show many women with PCOS had increased fatigue and low energy. Another symptom is hirsutism which is the common clinical presentation of hyperandrogenism occurring up to 70% of women with PCOS. It shows the extreme hair growth in areas such as face, arms, back, chest, toes, abdomen, and link to the PCOS due to the hormonal imbalances (Bart et al., 2012). Thinning hair on the head also one of symptoms of PCOS because the high levels of androgens can cause hair loss or thinning the scalp. Then, other signs and symptoms of PCOS are infertility and acne. Infertility happen because of dominant follicle does not develop, so ovulation does not ensue (Teede et al., 2010). For acne problems, it because of hormonal changes concern to androgens that lead to acne. Certain doctors advise inquiring about menstruation history and evaluating women for further indications of hyperandrogenism when they appear with acne (Lowenstein, 2006). Mood changes, pelvic pain, and sleep problems also signs and symptoms of PCOS. But not all women with PCOS have all these symptoms because different person may have a different mix of these features (Devi & Susila, 2022).

PCOS can happen at any age especially after the puberty. If women have obesity or they have a relative with PCOS syndrome, the risk of PCOS may be higher. While the precise cause of PCOS remains unknown, it is known to be a complex disorder with a hereditary component. The prevalence of PCOS in the general population is believed to be 4-6%, while 20–40% of first-degree female relatives of women with PCOS go on to develop PCOS themselves. Even though their relatives may never have received a diagnosis, many women with PCOS have female relatives who also have the condition. An underlying genetic predisposition is likely complicated by environmental and epigenetic factors such as lack of physical activity and an unhealthy diet (Hussin & Kadir, 2020). According to previous studies, less than half of the 7 million women with PCOS in the United States are aware that they have this disorder. Finding women who require medication requires public awareness of the disorder's symptoms, untreatable nature, and other factors. Recognizing the benefits of PCOS syndrome for healthy living, as well as its influence on women's longevity and quality of life, is crucial (Haq, Khan, Riaz, Nasim, Razzaq & Tahir,2017).

2.3 Knowledge on PCOS

Concerning knowledge on polycystic ovary syndrome (PCOS), a variety of studies have been conducted over various regions of the world, between different populations and groups. A study done by Kiran et al., (2023) among 141 participants of lady health visitors in Public Health Nursing School Lahore, there was majority of participants 64 (45.4%) had average knowledge regarding PCOS, 59 (41.8%) had poor knowledge and only 18 (12.8%) had good knowledge of PCOS (Kiran et al., 2023). Based on study done by (Reda et al., 2022),among 239 late adolescent girls, more than half of late adolescent girls had unsatisfactory knowledge about polycystic ovarian syndrome (Reda et al., 2022). Other study done by (Lotfy Mohamed El Sayed et al., 2019) who conducted study among adolescents, it revealed that there is inadequate knowledge regarding PCOS before educational sessions. These results also agreed by Haseena et al., (2019) that found the majority (77%) of adolescent girls had inadequate knowledge about PCOS.

According to study done by Jaber et al., (2022), the knowledge among 400 women aged 18-5 years old at the outpatient department of Jordan University Hospital, 89% of them were aware of the term PCOS. The patients' knowledge about complications of PCOS is less than one-fifth of them knowing that PCOS patients have an increased insulin resistance and increased blood sugar level (14% and 16.7%, respectively). Then, more than 50% of the samples either did not know or disagreed that PCOS patients have an increased risk of endometrial cancer. It shows that women have lack of knowledge regarding complications of the PCOS (Jaber et al., 2022).

According to Kumar et al., (2023), the knowledge of PCOS in a female community in India was show that they have poor knowledge regarding of PCOS

70(66%) and only 36 (34%) have a good knowledge (Kumar et al., 2023). Another study done by Abu-Taha et al., (2020) among female in Jordan, the result showed that the participants had inadequate knowledge about PCOS (Abu-Taha et al., 2020).

Regarding the knowledge about clinical presentation of PCOS, one of study done by Sasikala et al., (2021) among nursing students in a tertiary centre in a South India, 85% of respondents was responded as menstrual irregularities, half of them had knowledge about hirsutism (abnormal male type of hair distribution) and acanthosis nigricans (velvety patches over nape of the neck) (56.81.% and 61.36% respectively). Interestingly, most of them (84.09%) knew that infertility is caused by PCOS. Similar as the study done by Hussin & Kadir, (2020) among young students in Perak, most of respondents give the correct answer for all the questions regarding symptoms of PCOS. That means most of them know that abnormal or absence of menstrual (period) cycle, hair loss from scalp more than normal, severe acne problem during menstrual (periods), and abnormality of menstrual (period) cycle are symptoms of PCOS. for the medical and female students, most of them aware on this symptom of PCOS as it is related to women's common problem.

Contrast with study done by Devi & Susila, (2022) among 154 nursing students, it shows that majority nursing students had moderate knowledge 12 (77.9%), 21 (13.6%) had inadequate knowledge, and 13 (8.4%) had adequate knowledge regarding PCOS. It indicates that there is an urgent need to increase the level of knowledge about PCOS among nursing students. It is because nursing students are the personals who will give awareness and promote health to people in the future, so they need to improve their knowledge regarding PCOS.

2.4 Attitude on PCOS

Globally, PCOS incidence is growing rapidly but mostly young generations do not know this condition sufficiently. According to the finding of study the occurrence of signs and symptoms of PCOS are developing but still females are not aware of PCOS even its signs and symptoms were present in many of them. Based on study done by Hussin & Kadir, (2020) among nursing students in Perak, attitude of respondents regarding PCOS according to clinical evaluation mostly answered negative to all clinical parameters. While 83 (37.9%), 112 (51.1%), 91 (41.6%), 39 (17.8%), 35 (16.0%), 39 (17.8%), 127 (28.2%), 19 (18.7%) have periods that is very heavy (>2 pads per day), periods that more than 7 days, absence of periods completely or partial absence of periods (1 month), chronic acne problem during period, hirsutism which is excessive amount of body hair that is normally minimal or absent , abnormal weight gain that is continuously happen] and family histories diagnose with PCOS respectively. This result show that they are still not aware what is the PCOS look like as the syndrome still does not have an adequate educational intervention yet especially in Malaysia.

According to the study done by Jaber et al., (2022), the attitude among 400 women aged 18-75 years old at the outpatient department of Jordan University Hospital, overall respondents show the positive attitudes towards PCOS (Jaber et al., 2022). Another study done by Anitha et al., (2023) among adolescent girls in Kamataka, India, it states that few Indian studies have shown they have an unfavourable attitude toward PCOS. In this study, it also shows similar result which is overall adolescent girls 150 (100%) have unfavourable attitude toward PCOS. This study similar with the study from Egypt that also shows 52.7% of the girls had the negative attitude towards PCOS (Reda et al., 2022).

2.5 Association between socio-demographic factors and knowledge on PCOS

2.5.1 Age

According to the study done by Radwan et al., (2023), among 1368 Saudi females, it shows that Saudi women's knowledge regarding PCOS is inadequate. This study concluded that knowledge ratings were strongly correlated with age. 43.1% aged of participants between 20-30 years old, 22% aged between 31-40 years old and only 20.8% between aged 41-50 years old. For aged between 20-30 years old, the knowledge score for inadequate knowledge is 262 (32.8%), moderate knowledge 213 (54.5%), and good knowledge only 114 (64.4%). For the aged between 31-40, the result shows that 184 (23.0%) had inadequate knowledge, followed by 213 (54.5%),114 (64.4%) had moderate and good knowledge respectively. For the aged between 41-50, the inadequate, moderate, and good knowledge are 206 (25.8%), 59 (15.1%), and 19 (10.7%). This study shows that age influences the knowledge level of PCOS and mostly age between 20-30 shows good knowledge compared to the other age (Radwan et al., 2023).

Based on the study done by Ramakrishna Shabaraya, (2021) among female population in India, it was found that middle aged had better knowledge compared to young adults and older adults. It is very important to the female with childbearing age have good knowledge on PCOS. In this study, middle aged adults have good knowledge in terms of causes, symptoms, and complications compared to the other aged. So, some of the application of educational program for adolescent girls in different setting should be conducted to increase their level of knowledge on PCOS (Ramakrishna Shabaraya, 2021).

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2.5.2 Marital status

One study refers from by Radwan et al., (2023), among 1368 Saudi females, it shows that Saudi women's knowledge correlated with the marital status. In this study, the single status had more knowledge regarding PCOS 100 (56.5%) followed by married, divorced, and widowed 71 (40.1%), 45 (3.3%), and 0 (0.0%) respectively. For married women, this study shows that majority of them 504 (63.0%) had inadequate knowledge compared to the single which is 255 (31.9%), divorced 25 (3.1%), and widowed only 16 (2.0%) had inadequate knowledge. Next, for the moderate knowledge, majority women who married also higher which is 98 (50.6%), followed by single 100 (45.3%), divorced (3.6%), and widowed 2 (0.5%). Married women gain more knowledge about PCOS to avoid from some of risk or complication occurs.

Another study done by Bukhari et al., (2023) among Saudi female in western region of Saudi Arabia, it shows that majority females in this country had moderate knowledge (60%). It related to the level of awareness because in terms of marital status, the majority single and married status had a moderate awareness which is 134 (32.1%), and 103 (24.6%) followed by divorced and widow 11 (2.6%), and 3 (0.7%). The poor awareness influences the knowledge so, they must put programs in place to educate women in Madinah about the importance early detection and intervention to make them gain more knowledge about PCOS.

2.5.3 Educational level

Several studies state that educational level correlates and is associated with the level of knowledge on PCOS. One of the studies from Abu-Taha et al., (2020) among women in Jordan, it revealed that educational level significantly affects respondents' knowledge about PCOS (p-value = 0.008) (Abu-Taha et al., 2020). This study had similar finding that they confirmed by a study that conducted in Saudi Arabia that show the level of knowledge on PCOS was significantly related to higher educational level (Alessa et al., 2017).

Another study done by Jaber et al., (2022) also had similar result that shows high educational level is the most significant sociodemographic factor that attributed to the satisfactory and good knowledge towards PCOS (Jaber et al., 2022) .

2.5.4 Occupational status

Occupational status or employment is one of the factors that influences respondent's knowledge. Based on the study by Radwan et al., (2023) among Saudi women, it revealed that knowledge ratings were strongly correlated with employment. This study shows that students had good knowledge 65 (36.7%) compared to other occupations such as administrative officer, teacher, retired, worker in the health sector, and other 11(6.2%), 22 (12.4%), 2 (1.1%), 32 (18.1%), and 45 (25.4%) respectively Radwan et al., (2023). Based on study done by Jaber et al., (2022) among women at outpatient department of Jordan University Hospital, it revealed that the occupation has a positive association with knowledge of PCOS. Type of occupations can give impact to the knowledge towards PCOS especially on women who worked full-time job and bachelor's students (Jaber et al., 2022).

2.6 Theoretical Framework

Health belief model (HBM) is utilized as conceptual framework in guiding this study. HBM is an instrument developed 1950s by a group of social psychologists, Irwin M. Rosenstock, Godfrey M. Hochbaum, S. Stephen Kegeles and Howard Leventhal at U.S. Public Health Service to understand the failure of people in adopt disease preventionstrategies. Over the years, this model has been improved and used to explain health- related behaviour.

HBM is composed of components which are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cue to action and self-efficacy. Perceivedsusceptibility is the belief of an individual about the probability to get sick, perceived severity is the individual judgment of the seriousness of health condition, perceived benefit is the belief of positive outcome of health behaviour, perceived barriers is the belief about the hindrance of the health action, cue of action is readiness to take action after perceived susceptibility and benefit and self-efficacy is the self-motivation the individual to execute the health behaviour to produce the positive outcome. Demographic variables such as age, gender, and psychological characteristics such as personality, peer group pressure may indirectly influence health behaviour (Conner & Norman, 2015).

To change health behaviour, an individual must perceive treat by current health condition which is perceived susceptibility and severity, belief the health action will resultin a positive outcome which is perceived benefit and must be self-efficacy to conquer theperceived barriers for the health action to occur (Figure 2.1).
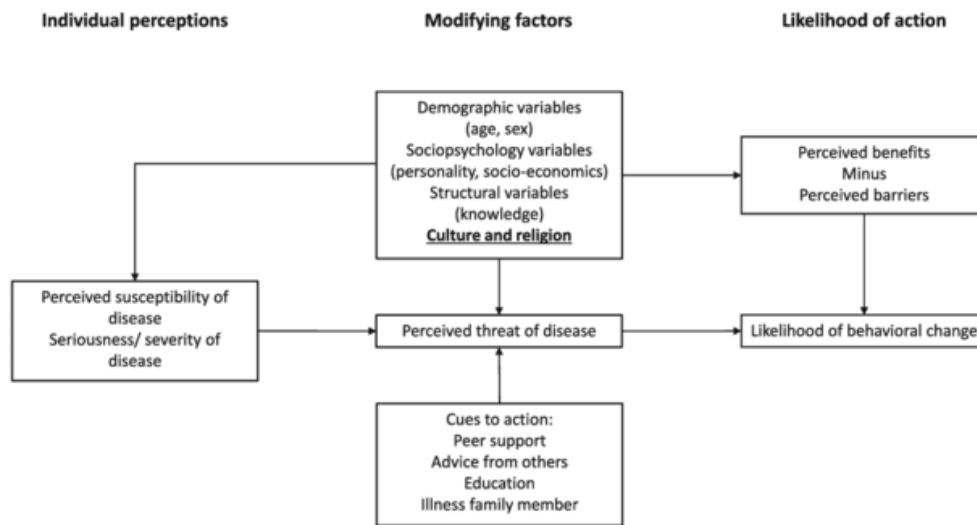
Figure 2. 1: Health Belief Model by Hochbaum, Rosenstock and Kegels (1950s)

2.7 Conceptual Framework

The conceptual framework for this study was adapted based on health belief model develop by a group of social psychologists at the United State Public Health in early 1950s. Based on figure 2.2 below, perceived susceptibility refers to individual feeling pf personal vulnerability to PCOS. The higher perceived risks, the greater the likelihood of changing in behavior to decrease risk of PCOS. Perceived seriousness is an individual's feeling about seriousness or severity of PCOS. This includes evaluation of both medical or clinical consequences and possible social consequences. The construct of perceived benefits is a personal belief of the usefulness of new behavior such as alert with the sign and symptoms of PCOS. A perceived barrier is the potential negative aspects of health action such as low level of knowledge and negative attitude toward PCOS.

INDIVIDUAL PERCEPTIONS	MODIFYING FACTORS	LIKELIHOOD OF ACTION

Selected demograhpic variable: age, marital status, level of education, occupational status

Prevent from risk of PCOS

Knowledge and attitude of PCOS

Perceived susceptibility or seriousness of PCOS

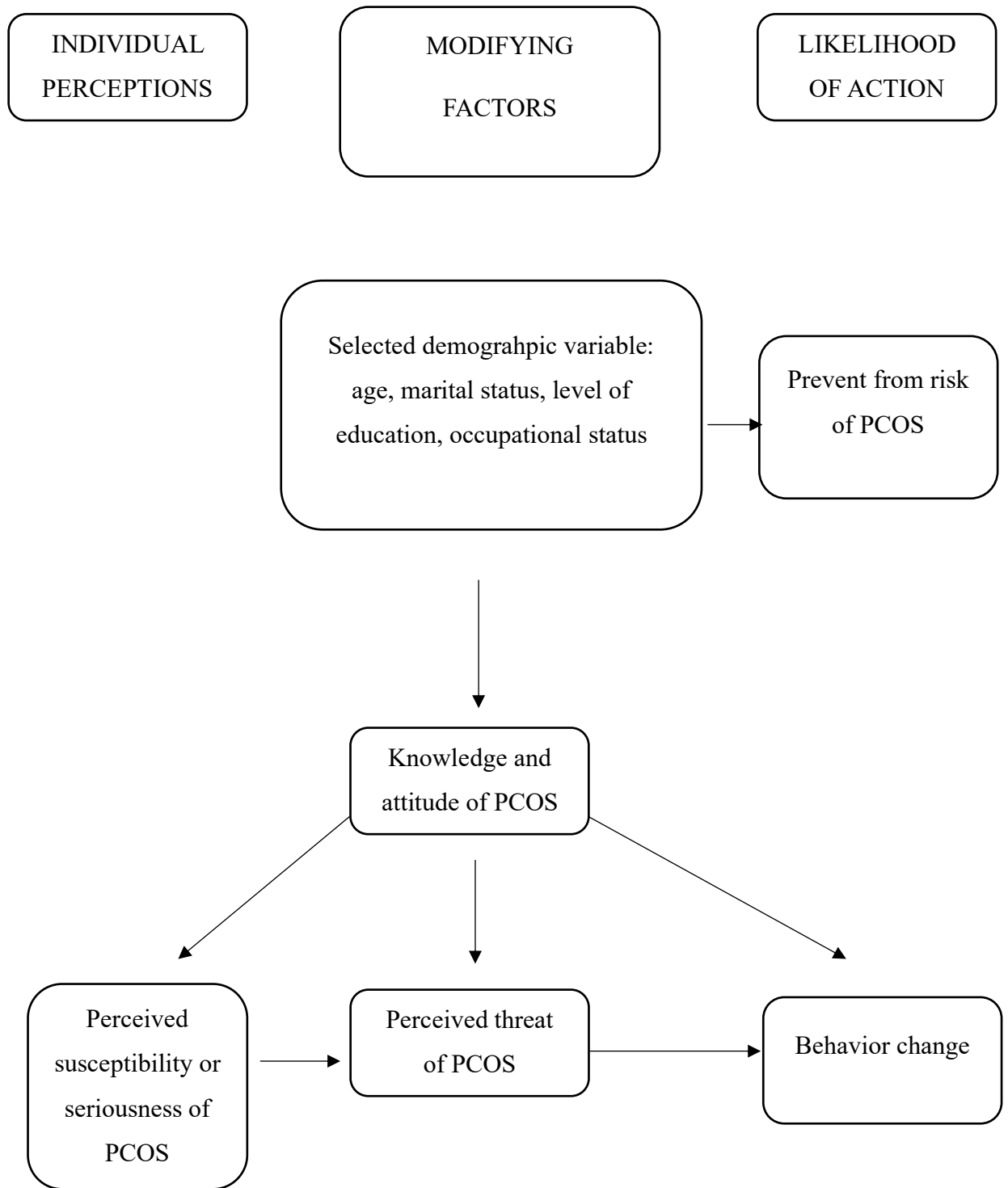Perceived threat of PCOS

Behavior change

Figure 2. 2: Polycystic ovary syndrome (PCOS) Knowledge and Attitude adapted from Health Belief Model by Hochbaum, Rosenstock and Kegels (1950s)

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

This section explained the approach and rationale used to support the chosen research methodology. The section is followed by research design, a description of study setting, population, participant selection criteria, sampling plan, sample size determination, and instrumentation, including ethical consideration right through data collection methods.

3.2 Research Design

In this study, cross-sectional study design was used. This approach is considered appropriate to give a detailed description of the participants' knowledge and attitude of polycystic ovary syndrome among women who attend the outpatient clinic in Hospital Universiti Sains Malaysia (USM).

3.3 Research Location

This study was conducted at outpatient clinics in Hospital Universiti Sains Malaysia Kubang Kerian, Kelantan. Hospital USM is one of the referral hospitals in Kelantan.

3.4 Research Duration

The study was conducted from October 2023 until August 2024.

3.5 Research Population

This study was conducted among women who attend the all-outpatient clinics including KPP, KRK, O&G, ENT, Ophthalmology, Surgery except psychiatric clinic in Hospital Universiti Sains Malaysia and fulfilling the study criteria.

3.6 Subject Criteria

3.6.1 Inclusion Criteria

Specific requirements for eligibility in this study of each subject must be:

• Women aged more than 18 years old to 60 years old.

• Women do not diagnose endocrine disorder such as Cushing syndrome, thyroid

  disorder, and adrenal disorder.

• Women that able to read and understand Malay language.

3.6.2 Exclusion Criteria

Subject is excluded from this study if they:

• Women has chronic medical illness and mental illness.

• Non-Malaysian citizen.

3.7 Sampling Plan

Sampling is to selecting numbers of subject from target population as research respondent (Chua, 2020). Sampling ensures that the validity and reliability of research to be representative of the population of interest. An effective sampling method enable researcher to achieve research goal.

3.7.1 Sampling Method

The type of sampling that was used in this study is convenience sampling. This method was chosen because it best meets the requirements of study as a respondent chosen to best represent the study's population (Chua, 2020).

3.7.2 Sampling Size Estimation

Objective 1: To assess the level of knowledge on polycystic ovary syndrome (PCOS) among women who attended the outpatient clinics in Hospital Universiti Sains Malaysia (USM).

In this study, single proportion formula was used to calculate the sample size based on the previous study conducted by (Sasikala et al., 2021) in South India.

$$n = \left[\frac{Z}{\Delta}\right]^2 p\,(1-p)$$

Where,

n = Sample size

p = Anticipated population proportion = 0.898, a

z = Value of standard normal distribution = 1.96

Δ = Precision = 0.05

n = 141 respondents

After considering 10% of response rate,

n = 155 respondents

Therefore, total sample size for this study is 155 samples.