

**KNOWLEDGE AND PRACTICE TOWARDS
MENSTRUAL HYGIENE AMONG FEMALE
ADOLESCENTS IN SECONDARY SCHOOLS IN
DISTRICT OF KOTA BHARU, KELANTAN**

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UNIVERSITI SAINS MALAYSIA**

2025

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DISTRICT OF KOTA BHARU, KELANTAN**

by

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

August 2025

DECLARATION

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



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Nur Hanis Hazirah Binti Roslan

Date: ...3 August 2025.....

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful. First and foremost, I would like to express my deepest gratitude to Allah SWT for granting me the strength, patience, and good health to complete this thesis successfully.

I would like to extend my sincere appreciation to my supervisor, Dr. Norhasmah Mohd Zain, for her invaluable guidance, encouragement, and continuous support throughout the research process. Her insightful feedback and constructive suggestions have significantly contributed to the quality of this study.

Taking this opportunity, I would like to thank all participants for their cooperation and willingness to participate in this research and make this study a reality. Without all of you, this dissertation would not be completed in a timely manner.

I would also want to express my gratitude to all my friends who have been with me throughout this academic journey, giving moral support, advice, and helped me a lot to complete this research. A special thank you goes to my beloved family, especially my parents, for their endless love, prayers, concerns, encouragement, and moral support. They are the backbone of me and my source of inspiration to succeed in order to complete the dissertation. Finally, not forgetting for those who directly and indirectly contributed to this research. Thank you very much.

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LIST OF ABBREVIATIONS

| | |
|--------|-------------------------------------|
| CI | Confidence Interval |
| CVI | Content Validity Index |
| HBM | Health Belief Model |
| JMP | Joint Monitoring Programme |
| LDC | Least Developed Countries |
| MHM | Menstrual Hygiene Management |
| RTI | Reproductive Tract Infections |
| SMK | Sekolah Menengah Kebangsaan |
| SPSS | Statistical Package Social Sciences |
| UNICEF | United Nations Children's Fund |
| USM | Universiti Sains Malaysia |
| UTI | Urinary Tract Infections |
| WASH | Water, Sanitation, and Hygiene |
| WHO | World Health Organization |

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**PENGETAHUAN DAN AMALAN TERHADAP KEBERSIHAN HAID DALAM
KALANGAN REMAJA PEREMPUAN DI SEKOLAH MENENGAH DI
DAERAH KOTA BHARU, KELANTAN**

ABSTRAK

Kebersihan haid merupakan aspek penting dalam kesihatan dan kesejahteraan remaja perempuan, namun ia masih dikelilingi oleh maklumat yang salah serta pantang larang budaya. Kajian ini dijalankan bagi menilai tahap pengetahuan dan amalan berkaitan kebersihan haid serta mengenal pasti hubungan antara ciri-ciri sosiodemografi dengan pengetahuan dan amalan dalam kalangan remaja perempuan di sekolah menengah di daerah Kota Bharu, Kelantan. Kajian keratan rentas ini melibatkan seramai 176 pelajar perempuan berumur antara 13 hingga 16 tahun yang dipilih melalui persampelan berstrata dan persampelan berdasarkan kebolehcapaian responden. Data dikumpulkan menggunakan soal selidik yang dijawab sendiri oleh responden. Analisis data dijalankan menggunakan ujian *Spearman's rank correlation*, *Kruskal-Wallis* dan *Mann-Whitney*. Hasil kajian menunjukkan bahawa 63.6% daripada peserta mempunyai tahap pengetahuan yang baik dan 55.1% daripada peserta mempunyai tahap amalan kebersihan haid yang baik. Berdasarkan analisis data, tiada hubungan yang signifikan ditemui antara tahap pengetahuan dan amalan kebersihan haid. Selain itu, tiada hubungan yang signifikan juga ditemui antara amalan kebersihan haid dengan faktor sosiodemografi. Walau bagaimanapun, terdapat hubungan yang signifikan antara pengetahuan kebersihan haid dengan beberapa ciri sosiodemografi, iaitu umur, tahap pendidikan ibu, dan media sebagai sumber maklumat. Dapatan kajian ini menekankan kepentingan pelaksanaan program pendidikan dan kempen kesedaran yang bersasar di sekolah bagi meningkatkan pengurusan kebersihan haid dalam kalangan remaja perempuan.

**KNOWLEDGE AND PRACTICE TOWARDS MENSTRUAL HYGIENE
AMONG FEMALE ADOLESCENTS IN SECONDARY SCHOOL IN
DISTRICT OF KOTA BHARU, KELANTAN**

ABSTRACT

Menstrual hygiene is a crucial aspect of adolescent girls' health and well-being, yet it remains surrounded by misinformation and cultural taboos. This study aimed to assess the level of knowledge and practice regarding menstrual hygiene and to examine the association between sociodemographic characteristics with both knowledge and practice among female adolescents in secondary schools in the district of Kota Bharu, Kelantan. A cross-sectional study was conducted involving 176 female students aged 13 to 16 years, selected through stratified and convenience sampling. Data were collected using a self-administered questionnaire. Spearman's rank correlation, Kruskal-Wallis and Mann-Whitney tests were employed for data analysis. The results revealed that 63.6% of the participants had good knowledge, and 55.1% of participants demonstrated good menstrual hygiene practices. Through the results analysed, there was no significant association found between knowledge and practice towards menstrual hygiene. Additionally, no significant associations were found between menstrual hygiene practices and sociodemographic factors. However, significant associations were found between menstrual hygiene knowledge and certain sociodemographic characteristics, specifically age, mother's educational level, and media as a source of information. These findings highlight the importance of implementing targeted educational interventions and awareness campaigns in schools to improve menstrual hygiene management among adolescents.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter provides the background of the study on knowledge and practice regarding menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan. It also outlines the problem statement, research aim, specific objectives, hypotheses, and the significance of the study.

1.2 Background of Study

Menstrual hygiene refers to the practices and products used to manage menstruation in a way that ensures cleanliness, comfort, and health (Wasan et al., 2022). According to the World Health Organization (WHO) and United Nations Children’s Fund (UNICEF) Joint Monitoring Programme (JMP), defined menstrual hygiene management (MHM) as “Women and adolescent girls are using a clean menstrual management material to absorb or collect menstrual blood, that can be changed in privacy as often as necessary for the duration of a menstrual period, using soap and water for washing the body as required, and having access to safe and convenient facilities to dispose of used menstrual management materials. They understand the basic facts linked to the menstrual cycle and how to manage it with dignity and without discomfort or fear.”(United Nations Children’s Fund (UNICEF), 2019).

For female adolescents, menstrual hygiene management (MHM) includes the knowledge and practices related to menstruation that are necessary during this transitional phase of puberty. Female adolescents often face unique challenges due to lack of knowledge (Varghese et al., 2015), limited access to menstrual products,

and lack of proper facilities for disposing of used menstrual products (Method et al., 2024). Based on the study (Method et al., 2024), insufficient privacy and poor sanitation in the school's toilet and home will expose female adolescents to mental, emotional, and physical challenges, particularly during their menstrual periods.

Proper MHM plays a vital role in preventing health issues such as reproductive tract infections (Santina et al., 2013), discomfort, urinary tract infections (Method et al., 2024), and abnormal vaginal discharge (Anand et al., 2015). According to Davis et al. (2018), it also contributes to improved educational outcomes by enabling girls to attend school regularly and engage in activities without the distraction or embarrassment that menstruation can bring. Moreover, proper management of menstrual hygiene reduces the psychological stress associated with menstruation and enhances the overall dignity and mental health of female adolescents (Mason et al., 2013).

Female adolescents' knowledge of menstrual hygiene can vary significantly depending on cultural and educational factors. A study by (Shanbhag et al., 2012) shows that many female adolescents have inadequate knowledge about menstruation and hygiene practices due to a lack of access to reliable information, especially in rural areas. Lack of proper health education programme in schools can be the reason female adolescents do not get the appropriate knowledge about menstruation (Shanbhag D et al., 2012).

Socio-economic and cultural factors often influence the practice of menstrual hygiene among female adolescents, reflecting their level of knowledge. Studies from (Van Eijk et al., 2016) in India show that even with a certain level of knowledge, numerous female adolescents fail to maintain proper menstrual hygiene because of obstacles like limited availability of sanitary products, concerns about privacy, and

social stigmas. Female adolescents with good knowledge about menstruation will have good practice in MHM, likely twice as much as those with poor knowledge (Bulto, 2021).

1.3 Problem Statement

Menstrual hygiene management (MHM) is a critical public health issue that significantly affects the well-being, education, and social participation of women and girls, particularly in low- and middle-income countries (Tshomo et al., 2021). For adolescent females, proper menstrual hygiene is essential to prevent health problems and support their emotional and educational development (Davis et al., 2018). However, poor knowledge and inadequate practices related to menstrual hygiene are common in developing countries, including Malaysia, where MHM remains a neglected issue. Many young girls lack accurate information and access to necessary resources, leading to physical health risks, emotional distress, and interruptions in education.

Despite growing recognition of the importance of MHM, many female adolescents continue to face significant challenges related to menstruation, including limited knowledge, inadequate access to menstrual hygiene products, and insufficient WASH (Water, Sanitation, and Hygiene) facilities (Davis et al., 2018). Daniel et al. (2023) reported that 2.3 billion people globally lack basic sanitation services, and in the least developed countries (LDCs), only 27% of the population has access to water and soap for handwashing. These challenges hinder safe menstrual management and expose young girls to unnecessary health risks.

Even when menstrual hygiene products are available, many adolescents in secondary schools remain uninformed about proper menstrual hygiene practices,

increasing their risk of infections and related health issues. A World Health Organization (WHO) report states that 2.3 billion girls and women worldwide struggle to manage menstruation safely due to inadequate facilities, high costs, or other factors (Shumie & Mengie, 2022). As a result, many resort to using old cloth or other unhygienic materials as menstrual absorbents, which further raises the risk of infection.

Numerous studies have documented the health risks associated with poor menstrual hygiene management, including urinary tract infections (UTIs) and reproductive tract infections (RTIs). The study by Anand et al. (2015) found a significant association between the practice of hygienic methods during menstruation and the prevalence of symptoms related to reproductive tract infections (RTIs); women who used hygienic methods were less likely to report symptoms of RTIs compared to those who did not. The World Bank (2022) noted that inadequate menstrual hygiene can significantly increase the risk of these infections, which can lead to long-term complications such as infertility and difficulties during childbirth. Every year, approximately 250 million people worldwide receive a diagnosis of UTIs, with a disproportionate impact on children and adolescents (Mackenzie, 2017). Females are particularly vulnerable due to anatomical factors, with 60% experiencing a lower UTI at some point in their lifetime (Belayneh & Mekuriaw, 2019). In Malaysia, research by Hassan et al. (2019) revealed that females accounted for the majority of UTI cases, highlighting the need for better menstrual hygiene education.

In addition to health risks, menstrual hygiene management has been linked to absenteeism in schools. Many female students miss school due to menstruation-related issues, often exacerbated by inadequate access to menstrual hygiene products and the stigma surrounding menstruation (Radin & Najib Husain, 2023). The lack of

affordable menstrual products forces many girls to use cloth rags, which are difficult to clean and manage in school settings, contributing to school absenteeism. In Kenya, a study found that 95% of menstruating girls missed one to three school days, and over 70% reported that menstruation negatively affected their academic performance (Mucherah & Thomas, 2019). However, there is currently no updated data on how menstrual hygiene affects school absenteeism in Malaysia. There is currently no study in Malaysia that investigates the correlation between menstrual hygiene and school absenteeism.

In Malaysia, research on menstrual hygiene is limited, with only two studies conducted so far, one focusing on nursing students and the other on adolescents aged 12 to 17 years. This study specifically targets female adolescents aged 13 to 16, as they are in a critical stage of development where understanding and managing menstrual hygiene is vital for their health and well-being. Syuhada et al. (2023), found that 90% of female adolescents in their study demonstrated a significant knowledge gap on this topic, highlighting the urgent need for more information and guidance. The lack of educational programs or curriculum-based interventions in Malaysian schools has persisted for a long time, contributing to poor menstrual hygiene practices among female adolescents due to insufficient knowledge.

By assessing the level of knowledge and practices regarding menstrual hygiene among female adolescents in secondary schools in Kelantan, this research will fill an important gap, aiming to improve menstrual hygiene practices among adolescents, reduce health risks, and promote school attendance. By identifying the gaps in knowledge and practice, this study will contribute to understanding how adolescents are managing their menstrual hygiene and the specific challenges they face. Furthermore, the findings will help inform the development of targeted educational

programs and policies that address the lack of menstrual hygiene education in schools to provide female students with accurate and age-appropriate information on menstrual hygiene. In addition, the research may highlight the need for improved WASH facilities in schools, advocating for policies that ensure better access to clean water, soap, and private sanitation facilities. The insights from this study can also influence public health policies aimed at reducing the prevalence of menstrual hygiene-related infections, such as UTIs and RTIs, by promoting hygiene practices. Ultimately, this research could lead to interventions that improve the health and educational outcomes of adolescent girls, contributing to their long-term well-being and success.

1.4 Research Questions

The research questions are:

1. What is the level of knowledge towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan?
2. What is the level of practice towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan?
3. What is the association between the knowledge and the practice towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan?
4. Is there any association between sociodemographic characteristics (age, mother's educational level, household income, source of information regarding menstruation) and the knowledge towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan?

5. Is there any association between sociodemographic characteristics (age, mother's educational level, household income, source of information regarding menstruation) and the practice towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan?

1.5 Research Objectives

1.5.1 General Objective

To determine the level of knowledge and practice towards menstrual hygiene and the association between sociodemographic characteristics with the knowledge and practice towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.

1.5.2 Specific Objectives

The specific objectives of this study are:

- i. To identify the level of knowledge towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.
- ii. To identify the level of practice towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.
- iii. To examine the correlation between the knowledge and the practice towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.
- iv. To determine the association between sociodemographic characteristics (age, mother's educational level, household income, source of information regarding menstruation) and the knowledge towards menstrual hygiene

among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.

- v. To determine the association between sociodemographic characteristics (age, mother's educational level, household income, source of information regarding menstruation) and the practice towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.

1.6 Research Hypothesis

Hypothesis 1 (H₀): There is no significant correlation between the knowledge and the practice towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.

(H₁): There is a significant correlation between the knowledge and the practice towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.

Hypothesis 2 (H₀): There is no significant association between sociodemographic characteristics (age, mother's educational level, household income, source of information regarding menstruation) and the knowledge towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.

(H₁): There is a significant association between sociodemographic characteristics (age, mother's educational level, household income, source of information regarding menstruation) and the knowledge towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.

Hypothesis 3 (H₀): There is no significant association between sociodemographic characteristics (age, mother's educational level, household income, source of information regarding menstruation) and the practice towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.

(H₁): There is a significant association between sociodemographic characteristics (age, mother's educational level, household income, source of information regarding menstruation) and the practice towards menstrual hygiene among female adolescents in secondary schools in the district of Kota Bharu, Kelantan.

1.7 Significance of study

The findings from this study will address and determine the level of knowledge and practice regarding menstrual hygiene among female adolescents in secondary schools. Understanding the knowledge and practice of menstrual hygiene is a significant part of female health and well-being, especially during adolescence (Sommer et al., 2015). This study contributes to improving their overall health,

preventing infections, and enhancing quality of life during their formative years. Cultural taboos and misinformation often surround menstruation (Dasgupta et al., 2008). This study will identify gaps in knowledge, enabling educators, parents, and health professionals to organize more effective menstrual health education programs.

According to (UNICEF, 2019), menstruation-related issues typically have a broader social and educational impact on female adolescents, particularly in relation to school absenteeism. This study can assist female adolescents in fully participating in school activities without interruption due to menstruation. This contributes to their academic performance, attendance, and participation in extracurricular activities. At the same time, this study can also reduce the rate of school absenteeism recorded by the Malaysian Ministry of Education.

The findings from this study also will guide the development of targeted educational programs aimed at improving menstrual hygiene and preventing infections among adolescents. Furthermore, it can identify barriers to effective menstrual hygiene management, as well as its association with RTIs and UTIs. Neglecting these gaps could lead to an increase in health issues like RTIs and UTIs, potentially negatively affecting quality of life and reproductive health (Car, 2006). If the issue is not resolved, the stigma and false knowledge about menstruation may persist, which could have a negative impact on adolescents' mental and self-esteem. Addressing these issues can improve overall health, improve educational outcomes, and reduce the stigma of menstruation.

1.8 Definitions of Operational Terms

There operational terms used in this research proposal are shown below:

Table 1.1 Operational and Conceptual Definitions

| | Conceptual Definition | Operational Definition |
|-------------------|---|--|
| Knowledge | According to Cambridge Dictionary (2024), knowledge means the understanding of or information about a subject that you get by experience or study, either known by one person or by people generally. | This study will assess the knowledge of menstrual hygiene regarding the definition of menstruation, menarche age, menopause age, menstrual cycle duration, function of absorbents used, interval time to change the pad, ways to handle used pads, function of washing hands, and health risks of poor menstrual hygiene using a self-administered questionnaire adapted from Yadav et al. (2018). |
| Practice | According to Cambridge Dictionary (2024), practice is something that is usually or regularly done, often as a habit, tradition, or custom. | This study will evaluate the menstrual hygiene practices of female adolescents, specifically focusing on the use of sanitary pads, regular pad changes, proper disposal of used pads, handwashing after handling used pads, cleaning the perineal area, and regular underwear changes, using a self-administered questionnaire adapted from Yadav et al. (2018). |
| Menstrual Hygiene | Women and adolescent girls are using a clean menstrual management material to absorb or collect menstrual blood, that | In this study, it refers to the respondents' actions in menstrual hygiene management, such as the use of sanitary pads, regular pad |

| | | |
|-------------------|--|--|
| | <p>can be changed in privacy as often as necessary for the duration of a menstrual period, using soap and water for washing the body as required, and having access to safe and convenient facilities to dispose of used menstrual management materials. They understand the basic facts linked to the menstrual cycle and how to manage it with dignity and without discomfort or fear (United Nations Children’s Fund (UNICEF), 2019).</p> | <p>changes, proper disposal of used pads, handwashing after handling used pads, cleaning the perineal area, and regular underwear changes, using a self-administered questionnaire adapted from Yadav et al. (2018).</p> |
| Female adolescent | <p>According to Cambridge Dictionary (2024), female adolescent is a young girl person who is developing into an adult.</p> | <p>In this study, it refers to the female adolescents that are 13 to 16 years old in secondary school.</p> |

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter provided a general review of the current literature on menstrual hygiene, covering topics such as knowledge and practice related to menstrual hygiene, as well as the relationship between socio-demographic characteristics (age, mother's educational level, household income, source of information regarding menstruation) and both knowledge and practice. The final section of this chapter described the theoretical and conceptual framework used in this study.

2.2 Menstrual Hygiene

Menstrual hygiene referred to the practices and materials used to manage menstruation effectively. It encompassed the use of clean menstrual products, proper disposal methods, and maintaining personal hygiene during menstruation. The reviewed studies consistently highlighted the importance of menstrual hygiene management (MHM) in promoting the well-being of adolescent girls. Effective menstrual hygiene management was essential to prevent discomfort, infections, and social stigma associated with menstruation (Zamri & Raheema, 2021).

Globally, menstrual hygiene remained a critical issue, particularly in developing regions where sanitation, and hygiene facilities exacerbated the problem (Santina et al., 2013). Adolescent girls, in particular, faced considerable difficulties managing their menstruation in school environments without adequate sanitation facilities. Studies in Ethiopia (Bulto, 2021) and Bangladesh (Nahar et al., 2019) showed that inadequate knowledge and a lack of WASH facilities often hindered proper menstrual hygiene practices in low-income regions. However, there was limited research on

WASH infrastructure in schools in District Kota Bharu, Kelantan. This study did not significantly emphasise the WASH facilities available in schools, as Kota Bharu maintained access to water but is not considered a rural area.

Poor menstrual hygiene could lead to various health issues, including reproductive disorders and increased absenteeism from school. The poor hygiene practices, coupled with cultural stigmas, significantly impacted girls' quality of life and increased their vulnerability to infections (Belayneh & Mekuriaw, 2019). Education and awareness among young girls, particularly in regions where cultural taboos existed, underscored the importance of proper menstrual hygiene (Al Mutairi & Jahan, 2021).

The social and cultural beliefs surrounding menstruation also had a profound effect on menstrual hygiene management. Studies from Bhutan (Tshomo et al., 2021), Lebanon (Santina et al., 2013), and Nepal (Yadav et al., 2018) highlighted the persistence of taboos and myths about menstruation in many cultures, often restricting girls from participating in normal activities like religious ceremonies, cooking, or even attending school during menstruation. Research conducted in Nepal demonstrated that cultural practices, such as the “Chhaupadi” system, which isolated menstruating girls, contributed to their inability to manage menstruation effectively (Yadav et al., 2018).

In a qualitative study by Syed Abdullah (2022), Temiar women were found to observe strict dietary restrictions during menstruation, avoiding salt, oil, meat, and monosodium glutamate (MSG) as symbolically tied to spiritual protection because of the belief that menstruating women are vulnerable to supernatural harm and can negatively affect their surroundings if taboos are violated. The study further explained that restrictions around bathing and river access stemmed from spiritual beliefs about evil spirits attacking women during menstruation, a notion passed down across

generations (Syed Abdullah, 2022). This study might not have been associated with social and cultural beliefs, as the District of Kota Bharu lacked a diverse range of cultures.

2.3 Knowledge of Menstrual Hygiene

Knowledge of menstruation and menstrual hygiene involved understanding the biological process of menstruation, adopting proper sanitary practices, and recognised the health implications associated with menstrual hygiene. Adequate knowledge in these areas was essential for women, especially those in their reproductive years, as it helped maintain health and prevent potential issues related to well-being. A study conducted among adolescent girls in West Bengal revealed that 85.05% had accurate knowledge of menstruation, whereas 15.04% believed it to be either a disease or a curse from God (Manna et al., 2019). Although knowledge of menstrual hygiene was vital, many female adolescents still had an incomplete understanding of how to properly manage menstruation. Various studies showed that misconceptions about menstruation were widespread, with many girls lacking awareness of its biological causes.

The primary sources of menstrual health information for adolescent girls were typically mothers, teachers, and peers. However, these sources often conveyed incomplete knowledge due to cultural myths. For instance, a study by Tshomo et al. (2021), found that mothers were the main source of information for 50.3% of adolescents, followed by teachers (19.5%) and friends or sisters (14.4% and 14.3%, respectively). Despite their important role, these sources might have unintentionally perpetuated misconceptions due to cultural or social taboos around menstruation.

Research assessing menstrual knowledge among adolescents revealed mixed results. In Buraidah city, for instance, 61.7% of girls had an acceptable level of knowledge about menstruation, while 36.3% exhibited poor knowledge (Al Mutairi & Jahan, 2021). Another study conducted in southern Ethiopia reported that 68.3% of female adolescents had limited knowledge about menstruation (Belayneh & Mekuriaw, 2019). Findings like these indicated that although some adolescents possessed moderate knowledge, a substantial number lacked a full understanding of menstrual hygiene practices.

A knowledge gap regarding menstruation was prevalent, often exacerbated by cultural taboos and misconceptions, leading to inadequate hygiene practices and feelings of shame. For instance, a South Chennai study revealed that 85.3% of adolescent girls discovered menstruation only after their first period (Varghese et al., 2015). Similarly, in a study in India, while 88.4% of respondents understood menstruation as a normal biological process, a small portion (4.7%) still viewed it as a curse (Manna et al., 2019). A study conducted in Malaysia by Noor Syuhada Abdul Hakim et al. (2023) revealed that many adolescent girls lack adequate knowledge about menstruation and menstrual hygiene, with 90% expressing the need for more information. Although 60% of the respondents received information from their mothers, 75% reported feeling scared during their first menstruation (Noor Syuhada Abdul Hakim et al., 2023). These gaps highlighted the need for comprehensive education on menstrual health to support adolescents in developing proper hygiene practices and addressing misconceptions.

2.4 Practice of Menstrual Hygiene

Menstrual hygiene practices varied significantly across individuals and communities, encompassing a range of behaviours such as the frequency of changing sanitary products, bathing during menstruation, and maintaining genital hygiene. According to Yadav et al. (2018), only 39% of respondents reported changing their pads every 4-6 hours, while 61% washed their hands after changing pads using soap and water, indicating that overall menstrual hygiene practices remained relatively low.

Access to sanitary products, availability of washing facilities, and privacy were key factors influencing these practices (Bulto, 2021). Research suggested that girls who had access to appropriate menstrual hygiene products and facilities were more likely to attend school during their menstrual periods. Furthermore, according to Wasan et al. (2022), financial constraints emerged as a substantial barrier to using sanitary pads, with 48.7% of participants identifying cost as an obstacle. Lack of availability and limited awareness about suitable materials for managing menstrual hygiene were reported by 17.4% and 12.1% of participants, respectively. Additionally, 21.9% of participants cited cultural and religious beliefs as reasons for not using sanitary pads, while others highlighted the lack of sanitation facilities for disposing of sanitary products as a challenge (Wasan et al., 2022).

In a study conducted in the Doti district, only 40% of female respondents demonstrated good menstrual hygiene practices, while 51% had fair practices. Although the use of sanitary pads was relatively common (21.3%), a considerable number of girls still used homemade or reusable pads (53.9%), which might have posed hygiene concerns (Yadav et al., 2018). These findings underscored the need to promote safe and proper menstrual hygiene practices to ensure health and comfort during menstruation. Varghese et al. (2015) further highlighted this need, reporting

that most participants exhibited poor menstrual hygiene practices, with over 80% scoring below 50% in hygiene practices. This indicated a critical gap in the adoption of safe menstrual hygiene practices among adolescent girls.

While various studies have investigated the practice of menstrual hygiene among adolescent girls globally, there remains a noticeable gap in translating knowledge into consistent hygienic behaviour. Although many adolescents are aware of basic menstrual hygiene practices, studies have found that only a portion of them actually adopt proper methods, such as changing pads regularly, using clean absorbents, and maintaining personal hygiene. The research gap lies in understanding the underlying factors contributing to this discrepancy between knowledge and practice such as cultural taboos, limited access to sanitary products, or lack of private facilities which are often underexplored in rural Malaysian contexts. This gap underscores the need for localized studies that examine how sociodemographic factors influence menstrual hygiene practices in rural Malaysian secondary schools.

2.5 Knowledge and Practice of Menstrual Hygiene

The association between knowledge and practice of menstrual hygiene was a critical focus in adolescent health research, especially among female adolescents. A study among female nursing students in Dhaka City revealed that 57.5% of participants had only a moderate level of knowledge about menstrual hygiene. This often led to inconsistent practices, such as infrequently changing sanitary materials, with some students reporting changing only once per day (Nahar et al., 2019). This pattern indicated that a limited understanding of hygiene practices, such as the importance of regular changing, could result in suboptimal behaviours that might have impacted health.

Similarly, Varghese et al. (2015) identified a positive correlation between menstrual hygiene knowledge and practice. Despite this link, many adolescent girls demonstrated limited knowledge, with a substantial number scoring below 50% in their overall hygiene practices. This knowledge gap contributed to inadequate practices, such as infrequently changing sanitary products and insufficient genital cleaning. These behaviours could have increased the risk of health issues, including reproductive tract infections (RTIs) and other hygiene-related complications, emphasizing the need to bridge the knowledge-practice gap to promote healthier menstrual management among adolescents.

The study in Western Ethiopia further underscored the importance of knowledge, revealing that adolescent girls who possessed good knowledge of menstruation were 2.9 times more likely to practice effective menstrual hygiene management (MHM) compared to those with lower knowledge levels (Daniel et al., 2023). While knowledge generally promoted better practices, other barriers such as cultural norms and socioeconomic factors could have complicated this relationship (Manna et al., 2019). Therefore, it is essential to implement targeted educational programs that not only enhanced menstrual knowledge but also addressed the sociocultural barriers that hindered proper hygiene practices. Comprehensive education should encompass not only the biological aspects of menstruation but also practical advice on hygiene, disposal methods, and the significance of cleanliness in menstrual health.

Studies indicate that knowledge and practice of menstrual hygiene are interrelated; however, high knowledge does not always ensure good practice. For instance, a study conducted in rural Negeri Sembilan, Malaysia by Noor Syuhada Abdul Hakim et al. (2023) revealed that although 60% of adolescent girls received

menstrual information from their mothers, 90% still reported needing more knowledge, and only 69% changed their sanitary pads three times daily, indicating suboptimal hygiene practice. This Malaysian study highlights the gap between awareness and behavioral outcomes, suggesting that even with awareness, factors like fear, shame, or socioeconomic constraints may hinder proper practice.

2.6 Sociodemographic Factors Associated with Knowledge of Menstrual Hygiene

Several studies had examined how sociodemographic characteristics were associated with the level of knowledge regarding menstrual hygiene. These studies investigated factors such as age, mother's educational background, household income, and sources of menstrual information that influenced adolescents' understanding of menstrual hygiene.

2.6.1 Age

Age has a considerable influence on the level of menstrual hygiene knowledge among adolescent girls. As girls mature, their exposure to menstruation increases, which often improves their understanding of menstrual health. According to a study by Belayneh & Mekuriaw (2019), older adolescents demonstrated significantly higher knowledge about menstruation compared to their younger peers. This was supported by Zamri & Raheema (2021), who found that younger girls were often unprepared for menarche and lacked essential menstrual knowledge. While a study by Wasan et al. (2022) in rural Pakistan found no significant difference in hygiene material use between age groups 15–19 and 19–23, it did indicate that older adolescents had greater menstrual preparedness, implying a more developed understanding of menstruation.

Thus, age progression is often associated with an enhanced level of menstrual hygiene awareness among female adolescents.

2.6.2 Mother's educational level

A mother's educational background is one of the most influential predictors of her daughter's knowledge of menstrual hygiene. This is because educated mothers are more likely to initiate early conversations about menstruation, correct myths, and provide scientifically accurate information. Bhusal (2020) reported that adolescent girls whose mothers had higher education were significantly more knowledgeable about menstruation compared to those whose mothers had limited or no formal education. This relationship was further supported by a study in Chitwan, Nepal, where maternal education was identified as a strong predictor of menstrual knowledge among adolescent girls (Khanal et al., 2023). Similarly, research conducted in Eastern Uttar Pradesh, India, confirmed that girls whose mothers had received secondary or higher education were more likely to possess acceptable levels of menstrual hygiene knowledge (Rathoria et al., 2024). In the Malaysian context, Zamri & Raheema (2021) also reported that maternal education played a key role in shaping girls' understanding of menstruation, reinforcing the pattern observed across diverse geographic and cultural settings. These consistent findings emphasize that improving maternal education could be a crucial strategy in enhancing menstrual health literacy among adolescent girls.

2.6.3 Household income

Household income directly impacts adolescents' knowledge of menstruation by affecting access to educational resources and hygienic products. Al Mutairi & Jahan (2021) found that girls from higher-income families had better knowledge due to improved access to menstrual products and exposure to educational materials.

Financial stability allows for the purchase of sanitary items and healthcare, increasing the opportunity for girls to learn proper menstrual practices. Moreover, Bulto (2021) suggested that economic constraints often prevent families from prioritizing menstrual education, especially in low-resource settings. In contexts like Malaysia, while access to basic education is widespread, economic disparities can still hinder access to supplementary educational resources about menstruation.

2.6.4 Source of information regarding menstruation

The source of menstrual information critically shapes what adolescents understand about menstrual hygiene. Tshomo et al. (2021) found that adolescents who received menstrual information from formal sources like teachers and health programs had significantly higher knowledge than those who learned from peers or the media. Although mothers are often the primary source of menstrual information, as reported in studies by Santina et al. (2013) and (K et al., n.d.), the reliability of such information may be affected by traditional beliefs and misconceptions passed down through families. Bulto (2021) highlighted that girls who received menstrual education before menarche, especially from school programs were more likely to exhibit accurate knowledge. Therefore, while mothers are a key source, institutional education ensures better knowledge transfer.

2.7 Sociodemographic Factors Associated with Practice of Menstrual Hygiene

There were numerous studies that determined the association between sociodemographic characteristics with the practice of menstrual hygiene. The study explored various characteristics that influenced these practices, including age, mother's

educational level, household income, and sources of information regarding menstruation.

2.7.1 Age

Age played an essential role in influencing the understanding and practice of menstrual hygiene. A study conducted in southern Ethiopia found that younger girls under the age of 15 were 1.71 times more likely to exhibit poor menstrual hygiene practices compared to older girls (Belayneh & Mekuriaw, 2019). Studies consistently showed that younger girls were often unprepared for menarche and lacked knowledge about proper hygiene (Zamri & Raheema, 2021). Similarly, a study of 1,522 adolescent girls in India found that older girls generally practiced better menstrual hygiene than their younger peers (Varghese et al., 2015). This study examined which age group demonstrated better practices, though the age range of 13 to 16 years may have shown only minor significance, given the relatively close ages of the participants.

2.7.2 Mother's educational level

A mother's level of education played a crucial role in influencing her daughter's menstrual hygiene practices. A previous study among adolescent girls in Nepal demonstrated a significant association between maternal education and menstrual hygiene practices (Bhusal, 2020). The findings indicated that adolescent girls with literate mothers were 0.52 times less likely to engage in good menstrual hygiene practices compared to those whose mothers had a higher level of education. This aligned with Santina et al. (2013), who observed that menstrual hygiene management (MHM) practices declined as the mother's educational level decreased. However, a contrasting study among nursing students found no significant association between maternal education and menstrual hygiene practices (Zamri & Raheema, 2021). This study aimed to further investigate whether mother's education influenced menstrual

hygiene practices. Administrators and policymakers anticipated the findings to provide insights for the development of targeted menstrual hygiene education programs, particularly for parents, with a strong emphasis on mothers' roles in promoting these practices.

2.7.3 Household income

Household income had a direct impact on girls' ability to access sanitary materials. Family monthly income showed a significant association with menstrual hygiene practices among girls (Al Mutairi & Jahan, 2021). In low-income families, girls often relied on homemade or reusable materials, leading to poor hygiene practices due to limited access to sanitary pads and adequate cleaning facilities (Belayneh & Mekuriaw, 2019). Higher income levels were frequently linked to better access to menstrual hygiene products and education (Al Mutairi & Jahan, 2021). Girls from wealthier households were more likely to use disposable sanitary pads, contributing to improved hygiene practices. Additionally, girls who received consistent pocket money from their families were nearly three times more likely to practice good menstrual hygiene compared to those without such financial support (Upashe et al., 2015). Tshomo et al. (2021) emphasized that economic constraints could restrict the options available to girls and women, impacting their ability to manage menstruation effectively. This suggested that producing and ensuring access to affordable, hygienic sanitary materials was crucial to improving menstrual hygiene management (MHM) in the study setting (Wasan et al., 2022).

2.7.4 Source of information regarding menstruation

The source of information about menstruation played a significant role in shaping female adolescents' knowledge, practices, and overall management of menstruation. A study in Lebanon found that most respondents (86.9%) had identified