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Pregnant women's perception of the importance of reducing mosquito infestation in hospitals: Evidence from Selangor, Malaysia

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ABSTRACT
Mosquito infestation poses a serious threat to Selangor, Malaysia. Pregnant women are exposed to the risk of mosquito-borne diseases during hospital visits. This study aimed to examine pregnant women's perceptions of the importance of reducing mosquito infestation and whether demographic characteristics influence their perceptions. A quantitative research design was used in this study. A questionnaire survey was conducted among 100 pregnant women attending a tertiary government hospital in Selangor, Malaysia. The questionnaire included demographic variables as well as a five-point Likert scale to measure the importance of reducing mosquito infestation. Descriptive statistics showed that participants considered reducing mosquito infestations in hospitals to be "very important." One-way ANOVA showed that there were no statistically significant differences in the importance scores of different demographic variables ($p > 0.05$), indicating that the cognition was relatively consistent among different subgroups. However, education level showed a near-significant effect, suggesting that the underlying trends warrant further exploration. These findings highlight the overall importance of reducing mosquito infestation in hospitals, underscoring the value of broad-based health education and public health interventions. Future studies with larger samples are recommended to explore potential subgroup differences.

Contribution/Originality: The primary contribution of the paper is the finding that there is a strong consensus among pregnant women regarding the importance of reducing mosquito infestation in hospitals, with no demographic differences observed. This suggests that interventions aimed at controlling mosquito infestation in hospitals can be broadly implemented among pregnant women in Selangor, Malaysia.

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1. INTRODUCTION

Mosquito infestation is a significant economic and health burden in tropical countries. Malaysia's climate and geographical environment provide a favorable living environment for mosquitoes (Hii, Rafdzah, Nasrin, & Joacim, 2016; Nellis, Loong, Abd-Jamil, Fauzi, & AbuBakar, 2021). The country's Ministry of Health reported that 63% of dengue fever cases in the decade from 2013 to 2022 occurred in Selangor (Teh et al., 2024). Compared to other regions, Selangor is the area with the most severe mosquito infestation in Malaysia. Pregnancy further compounds the impact of mosquito infestation. Pathogens carried by mosquitoes are transmitted to the fetus through the placenta (Watanabe & Vasudevan, 2023). Once a pregnant woman is infected with a mosquito-borne disease, it poses a health threat to both the mother and the fetus, leading to a series of adverse pregnancy outcomes. Pregnant women in this region may face a significant threat from mosquito infestation.

Hospitals are public spaces frequently visited by pregnant women. According to the World Health Organization (WHO), pregnant women should have at least eight antenatal visits during pregnancy to reduce perinatal mortality and improve their antenatal care experience (World Health Organization, 2016). However, as a space with a large number of people gathered, hospitals are one of the important places for the spread of infectious diseases. Frequent contact between patients, caregivers, and medical staff in the same environment makes hospitals a high-risk setting for pathogen transmission (CDC, 2024). Pregnant women in Selangor, Malaysia, may be exposed to mosquito-borne diseases when visiting hospitals.

Hospitals are spaces where mosquito infestation has the most serious impact on pregnant women. Girard et al. (2021) indicated that medical waste is a breeding ground for mosquitoes (Girard et al., 2021). As well, Egboh, Otike-Odibi, Altraide, and Awopeju (2018) pointed out that hospital patients, medical staff, and visitors may be infected, potentially infected, or asymptomatic carriers of mosquito-borne diseases (Egboh et al., 2018). Additionally, patients may come into contact with contaminated medical equipment, leading to infections with mosquito-borne diseases (Suleyman, Alangaden, & Bardossy, 2018). Furthermore, Sanfelice (2022) reported that fetuses and newborns are reservoirs for pathogens, in addition to pregnant women (Sanfelice, 2022). Cross-infection caused by hospital mosquitoes in hospitals not only threatens the health of the mother but also affects the health of the fetus or newborn.

Whether pregnant women can correctly recognize the importance of reducing mosquito infestations in hospitals is of great significance to public health and maternal–infant safety. Most studies on mosquito infestations in Selangor, Malaysia, have focused on epidemiological characteristics (Salim et al., 2021; Tay et al., 2022). A limited number of studies have preliminarily explored pregnant women's knowledge, attitudes, and practices regarding the Zika virus in this region (Wong, Alias, Lee, & AbuBakar, 2023). Although the study has paid attention to the responses of pregnant women to mosquito infestation, it has mainly concentrated on community settings. Feedback from pregnant women on the importance of reducing mosquito infestations in hospitals remains lacking.

This study aimed to collect feedback from pregnant women in Selangor, Malaysia, on the importance of reducing mosquito infestation in hospitals through a quantitative questionnaire survey and to explore the relationship between sociodemographic variables (age, gravidity, pregnancy stage, and education level) and cognitive attitudes. Through empirical analysis, this study aims to inform policy development for hospitals regarding mosquito prevention measures for pregnant women and strengthen public health interventions.

2. LITERATURE REVIEW

Existing research on the health impacts of mosquito infestation has highlighted hospitals as a setting with a high incidence of cross-infection and a high risk of infection. Pregnant women are a vulnerable group in mosquito infestations due to their decreased immunity and the dual requirements of fetal safety (World Health Organization, 2024). Therefore, exploring pregnant women's perceptions of the importance of reducing mosquito infestation in hospitals not only helps to explore their genuine feedback as stakeholders but also provides important evidence for public health interventions. This literature review examines mosquito infestation in Malaysia and hospitals, then summarizes the health impacts of mosquito infestation on pregnant women. Furthermore, it analyzes relevant research on risk perception and demographics. Finally, it identifies deficiencies in existing research, which leads to hypotheses for this study.

2.1. Mosquito Infestation in Selangor, Malaysia

Mosquito infestation is a serious problem in Malaysia, especially in Selangor. Pregnant women in the area are at risk of the health effects of mosquitoes. Pregnant women in the region are at significant risk for the health effects of mosquitoes. The country's tropical rainforest climate and mangrove ecosystems provide a favorable habitat for mosquitoes (Pathy, Lee, & Yek, 2022). In addition, the time and costs associated with mosquito-borne diseases impose an economic burden on the country (Khaw, Razali, Shamsuddin, Abidin, & Chan, 2024). The country's severe mosquito infestation is a result of a combination of geoclimatic conditions, the consequences of mosquito-borne diseases, and the economic burden. The country still faces significant challenges in mosquito control. Selangor is the most severely affected dengue fever region in the country, with over half of the country's dengue cases concentrated there (Teh et al., 2024). In addition, due to the complex geographical environment and high population density, the region is more conducive to mosquito breeding and the spread of mosquito-borne diseases than other regions (Cheong, Leitão, & Lakes, 2014). Consequently, Selangor is the region in Malaysia most severely affected by mosquito infestation. Previous studies have focused on the knowledge, attitudes, and practices of pregnant women in the region regarding dengue and Zika virus (Woon et al., 2019). However, existing research has not focused on developing strategies to reduce the impact of mosquito infestation on pregnant women. Although studies have addressed the use of chemical mosquito

control agents in hospitals in the country (Rasli et al., 2021), chemical mosquito control may pose a potential safety risk to pregnant women. Therefore, what safety measures can be taken to reduce the impact of mosquitoes on pregnant women in this area remains underexplored.

2.2. The Threat of Mosquito Infestation in Hospitals to Pregnant Women

Hospitals are at higher risk of mosquito infestation. Researchers reported the presence of Aedes aegypti mosquitoes during a survey of hospitals in Thailand (Nonyong et al., 2021). What more, a study reported that hospital obstetric departments had more Aedes aegypti mosquitoes than other areas of the hospital (Carvalho-Leandro et al., 2010). In addition, in hospitals, human blood, water, and various forms of organic matter attract mosquitoes (Facchinelli, Badolo, & McCall, 2023). These positive mosquitoes may bite pregnant women during prenatal checkups and childbirth. Tolle (2009) noted that mosquito-borne diseases are a common route of infection (Tolle, 2009). Therefore, pregnant women in hospitals are at a higher risk of being bitten by mosquitoes and contracting mosquito-borne diseases.

2.3. Feedback from Pregnant Women on Mosquito Infestation In Hospitals

Previous research on pregnant women's responses to mosquito infestations in hospitals has shown that some report discomfort and psychological harm. In a cross-sectional questionnaire survey of mosquito control at a tertiary teaching hospital in Nigeria, researchers found that pregnant women reported experiencing more mosquito bites in the hospital than elsewhere, leading to early discharge (Efunshile et al., 2021). Furthermore, mothers feel that mosquitoes in hospitals cause them to feel aggrieved and have negative emotional consequences. A cross-sectional study in maternity hospitals in Kenya showed that mothers reported high mosquito counts and felt they were not treated respectfully in such environments (Okedo-Alex, Akamike, Nwafor, Abateneh, & Uneke, 2020). A study evaluating efforts to improve maternal and child health in health centers in Mali showed that mothers complained about high mosquito counts in hospital care environments (Ngangue et al., 2023). Existing research on pregnant women's feedback on mosquito infestation in hospitals has primarily focused on Africa. Some studies in Malaysia have examined pregnant women's knowledge and attitudes toward the Zika virus (Wong et al., 2023). However, these investigations have primarily focused on community settings, and feedback from pregnant women regarding the importance of reducing mosquito infestations in hospitals remains absent.

2.4. Research Gaps and Research Hypotheses

In existing studies, demographic characteristics are considered to be important factors affecting individual health risk perception. Gesese, Mersha, and Balcha (2023) found that older pregnant women tend to have a higher awareness of pregnancy danger signs and take health-seeking actions, while younger pregnant women may have insufficient awareness (Gesese et al., 2023). The number of pregnancies and the stage of pregnancy may also influence pregnant women's attitudes toward health risk factors. For example, multiparous women may have a higher level of risk awareness after receiving more health education and clinical guidance (Huang et al., 2024). Pregnant women in the late stages of pregnancy are usually more concerned about safety and health and may even develop a fear of childbirth (Zhang et al., 2023). In addition, education level is an important factor explaining mosquito knowledge, mosquito prevention risks, and practices (Duval, Aschan-Leygonie, & Valiente Moro, 2023). However, empirical research on the relationship between demographic characteristics and perceived importance of reducing mosquito risk in hospitals among pregnant women in Selangor, Malaysia, is still limited and lacks quantitative analysis. This study aims to explore pregnant women's overall attitudes toward reducing mosquito risk and further examine whether their demographic characteristics significantly influence the perceived importance of risk. Based on the above analysis, this study proposes the following two hypotheses:

Hypothesis 1 (H_1): Pregnant women generally consider reducing mosquito infestation in hospitals to be important or very important.

Hypothesis 2 (H_2): Pregnant women's demographic characteristics significantly influence their perceived importance of reducing mosquito infestation in hospitals.

3. METHODOLOGY

3.1. Research Design

This study employed a quantitative research design to systematically gather information on the importance of reducing mosquito infestation in hospitals among pregnant women in Selangor, Malaysia. Most studies on pregnant women's feedback regarding mosquito infestation in Malaysia have employed questionnaires (Duval et al., 2023; Wong et al., 2024). Additionally, the questionnaire method was chosen as the main data collection tool because it has the advantage of being able to quickly and effectively collect respondents' cognitive levels (Taherdoost, 2022). Scaled questions were used to quantify the importance of mosquito infestation control reported by pregnant women in Selangor. The quantitative framework of this study helps to verify the research hypotheses and provides an evidence-based basis for future relevant intervention policies.

3.2. Study Setting

The study site was Hospital Tengku Ampuan Rahimah Klang (HTAR) in Selangor, Malaysia. The hospital is located in the southern part of Klang, as shown in the Figure 1. It is the largest and best-equipped government tertiary hospital in Selangor, Malaysia. It provides healthcare services to patients from Klang and other parts of Malaysia. In addition, Google Maps shows that there are parks with more vegetation to the north and west of HTAR; Klang River

and Port Klang are within 5 kilometers; and there are the sea and mangroves 5 kilometers to the left. Rivers, mangroves, and rich vegetation are features with higher numbers of mosquitoes (Dida et al., 2018). The environment around HTAR is conducive to mosquito breeding and can easily support a large number of mosquitoes. Pregnant women are at higher risk of mosquito bites when visiting this hospital. Mosquito infestation severely impacts pregnant women, making it a significant concern for this location.

Figure 1. Google Map of HTAR.

Source: Google Maps.

3.3. Participants

The subjects of the study are pregnant women. This study includes pregnant women who visited HTAR during the study period (December 2023 to January 2024). Furthermore, participants were pregnant women who were hospitalized at HTAR for antenatal care, labor, delivery, and after delivery. Pregnant women who visited other hospitals were not included in this study. Pregnant women may have difficulty moving and may be weak after giving birth. Although it was difficult for pregnant women to participate in this study, family members accompanying pregnant women were excluded from this study. Finally, in view of the generalizability and universality of the data results, the pregnant women included in this study have no restrictions in terms of age, race, professional background, occupation, education, nationality, and religion, reflecting the inclusiveness of the sample. The sample size of this study was 100 pregnant women. The sample size was set with reference to previous studies on pregnant women's feedback on mosquito infestation, with particular emphasis on research on hospital-based mosquito infestation feedback.

3.4. Instrument

The study used questionnaires to collect data. The questionnaire included demographic information, including age, gravidity, stage of pregnancy, and education level, as well as pregnant women's perception of the importance of reducing mosquito infestation in hospitals. These factors were derived from research on pregnancy risk perception among pregnant women. The risk perception section was measured using a five-point Likert scale, ranging from "very

unimportant" to "very important," reflecting the strength of pregnant women's attitudes toward reducing mosquito infestation risks in hospitals. 1 = very unimportant, 2 = unimportant, 3 = indifferent, 4 = important, and 5 = very important. Higher scores indicate a greater level of awareness of the importance of reducing mosquito infestation in hospitals. The questionnaire was originally designed in English and translated into Bahasa Melayu by experts to ensure accuracy of language expression and cultural adaptability.

3.5. Data Collection Procedure

Data collection was conducted between December 2023 and January 2024. Researchers conducted the study under the guidance of intern doctors and nurses. Specifically, the researcher was introduced to the pregnant women by a doctor or nurse to gain their trust. The researcher then briefly explained the study and the questionnaire procedures. This study was conducted on a voluntary basis. After declaring their willingness to participate, the pregnant women signed a respondent information sheet and informed consent form. Each questionnaire took an average of 5–10 minutes to complete. After the questionnaires were collected, the pregnant women were withdrawn from the procedures of this study.

3.6. Data Analysis Strategy

Data analysis for this study was conducted using SPSS 29.0 software. First, descriptive statistics were used to analyze the frequency and percentages of demographic variables (age, stage of pregnancy, gravidity, and education level) to characterize the sample. Second, a frequency analysis was conducted to analyze the importance of reducing mosquito infestation in hospitals, demonstrating the distribution of different levels of importance. In addition, means and standard deviations were analyzed to show the overall attitude tendency of pregnant women. Furthermore, ANOVA tests were used to explore differences in mosquito risk perceptions based on demographic variables. The significance level for all tests was set at $p < 0.05$ (Lee, 2022). This statistical method is consistent with previous related studies and can fully reveal the overall trends and differences in pregnant women's risk perception.

3.7. Ethical Considerations

As the subjects were pregnant women, detailed ethical considerations were conducted for this study. The Medical Research and Ethics Committee of Malaysia granted approval for this study on 10 November 2023 (Ref: 23-02989-OBO). The Medical Research Ethics Committee of Universiti Putra Malaysia (JKEUPM) granted approval for this study on 12 December 2023 (Ref: JKEUPM-2023-1304).

All respondents signed a written informed consent form before participating, ensuring they fully understood the study's objectives, procedures, and potential risks. Questionnaire data were strictly anonymized, collecting only necessary demographic information without identifying individuals. All data were stored on a password-protected computer, accessible only to members of the research team. Additionally, when distributing the questionnaire, the research team emphasized that participation was completely voluntary, and respondents could withdraw at any stage without any adverse consequences. Through these measures, this study maximized the protection of the rights and interests of pregnant women and the ethical compliance of the research.

4. DATA ANALYSIS

A total of 100 offline paper questionnaires were distributed, and 100 completed questionnaires were collected, resulting in a 100% response rate. Three questionnaires were excluded due to incomplete information provided by pregnant women.

The reliability of the questionnaire was tested using Cronbach's alpha coefficient. The results showed that the Cronbach's alpha coefficient of the questionnaire scale was 0.812, indicating good internal consistency ($\alpha > 0.70$). Exploratory factor analysis demonstrated that the questionnaire had good validity.

4.1. Demography

Descriptive frequency analysis was used to present the sample distribution. Table 1 presents the demographic characteristics of the 97 valid pregnant women interviewed in this study are as follows. The majority of respondents were born between 1991–1995 (36.0%) and 1986–1990 (29.9%), followed by those born between 1996–2000 (19.6%). Relatively small percentages were born between 1981–1985 (5.2%), 2001–2005 (8.2%), and 1975–1980 (1.0%). In terms of education level, high school education accounted for the highest proportion (37.1%), followed by secondary school (20.6%), master's degree (11.3%), and bachelor's degree (9.3%). Primary school education accounted for only 4.1%, while "other" education types accounted for 16.5%. No respondent had a doctoral degree. Regarding gravidity, 38.1% of pregnant women were first-time pregnant, 22.7% had three pregnancies, 18.6% had two, 13.4% had four, and 7.2% were classified as "others."

The stage of pregnancy showed that the respondents were mostly concentrated in the third trimester (29–40 weeks, accounting for 60.8%), followed by the second trimester (13–28 weeks, accounting for 22.7%), with only 1.0% in early pregnancy, and another 15.5% had already given birth. Overall, the sample group was mainly composed of young pregnant women, those with high school education or above, and in the late pregnancy stage, reflecting that the research subjects were representative in terms of health risk awareness.

Table 1. Demographic characteristics.

Categories		Sub-categories	Frequency	Percent%
Year of Birth	Valid	1975-1980	1	1
		1981-1985	5	5.2
		1986-1990	29	29.9
		1991-1995	35	36
		1996-2000	19	19.6
		2001-2005	8	8.2
Education	Valid	Primary school	4	4.1
		Secondary school	20	20.6
		High school	36	37.1
		Bachelor's degree	9	9.3
		Master's degree	11	11.3
		Doctorate degree	0	0
		Others	16	16.5
Gravidity	Valid	1	37	38.1
		2	18	18.6
		3	22	22.7
		4	13	13.4
		Others	7	7.2
Stage of pregnancy	Valid	First trimester (1-12 weeks)	1	1
		Second trimester (13-28weeks)	22	22.7
		Third trimester (29-40 weeks)	59	60.8
		Delivered	15	15.5
Total Number			97	100

4.2. Importance of Reducing Mosquito Infestation in Hospitals

Table 2 presents the descriptive analysis of the importance of reducing mosquito infestation indicates that a total of 97 valid responses were obtained. The results showed that the majority of pregnant women (n=67, 69.1%) considered mosquito reduction "very important," while another 30 (30.9%) considered it "important." No one selected "neutral," "not important," or "not important at all." The mean score of 3.69 (SD=0.465) suggests that pregnant women generally believe that mosquito reduction is highly important. The overall distribution demonstrates a high degree of consensus among respondents regarding this perception, with nearly all pregnant women agreeing on the importance of reducing mosquito risks.

Table 2. Descriptive analysis of the importance of reducing mosquito infestation.

Factors		Items	Frequency	Valid percent%	Mean	Std. deviation
Importance of mosquito reduction	Valid	Very important	67	69.1	3.69	0.465
		Important	30	30.9		
		Neutral	0	0		
		Unimportant	0	0		
		Very unimportant	0	0		
		Total	97	100		

4.3. Differences in Demographic Characteristics and Perceptions of Importance

One-way ANOVA was used to examine whether demographic characteristics were associated with pregnant women's opinions about the importance of reducing mosquito infestation in hospitals, as shown in Table 3. The results indicate that the year of birth had no significant effect on importance scores, $F(22,74)=1.511$, $p=0.097$. Differences across education levels approached significance but did not reach the conventional threshold, $F(5,91)=2.214$, $p=0.059$. Gravidity showed no significant variation among groups, $F(4,92)=1.230$, $p=0.303$. Similarly, pregnancy stage was not significantly related to perceived importance, $F(3,93)=0.161$, $p=0.922$. Overall, none of the four demographic factors exhibited a statistically significant effect on pregnant women's perceptions of importance (all $p > 0.05$). Nevertheless, the near-significant result for education level ($p=0.059$) suggests a potential trend toward an association between education and risk perception, which warrants further investigation in studies with larger sample sizes and more diverse populations.

Table 3. ANOVA results of demographic characteristics and importance perception.

Source of variation	SS (Between, within)	Df (Between, within)	MS (Between, within)	F	Sig.
Year of Birth	(6.423, 14.299)	(22, 74)	(0.292, 0.193)	1.511	0.097
Education	(2.248, 18.474)	(5, 91)	(0.45, 0.203)	2.214	0.059
Gravidity	(1.052, 19.669)	(4, 92)	(0.263, 0.214)	1.23	0.303
Stage of pregnancy	(0.107, 20.615)	(3, 93)	(0.036, 0.222)	0.161	0.922
Total	20.722	96			

4.4. Hypothesis Verification Summary

The results of the hypothesis tests are shown in Table 4. Hypothesis 1 (H1) was supported, indicating that pregnant women generally believed that reducing mosquito infestation in hospitals was very important. This suggests that the pregnant women surveyed had a high degree of consistency in their perception of the health risks associated with mosquito infestation in hospitals. Hypothesis 2 (H2) was not supported. The results of the one-way analysis of variance showed no significant differences in the importance scores between demographic characteristics such as age, education level, number of pregnancies, and stage of pregnancy. This indicates that the pregnant women surveyed had a nearly unanimous attitude toward the importance of reducing mosquito infestation in hospitals.

Table 4. Summary of hypothesis testing.

Hypothesis	Statement	Result
H1	Pregnant women overall perceive the reduction of mosquito infestation in hospitals as very important.	Supported
H2	Pregnant women's demographic characteristics (age, education level, gravidity, and pregnancy stage) significantly influence their perceived importance of reducing mosquito infestation in hospitals.	Not supported

5. DISCUSSION AND FINDING

The results of this study partially supported the research hypotheses. First, the finding that pregnant women generally believed that "reducing mosquito infestation in hospitals" was very important is consistent with existing literature. Previous studies have shown that pregnant women believe that mosquitoes in hospital environments can cause disease. At Port Harcourt Hospital in southern Nigeria, researchers found that one of the challenges faced by pregnant women in tertiary hospitals in utilizing maternal health care services was mosquito bites. Pregnant women reported that they were at high risk of contracting malaria when they returned home (Kasso, Chibianotu, & Ogu, 2020). In a teaching hospital in Iran, patients expressed dissatisfaction with the sanitary conditions of the obstetrics department and the presence of mosquitoes in the rooms (Saki et al., 2017). Therefore, the results of this study further verify the universality and consistency of pregnant women's perception of the risk of mosquito infestation in hospitals.

However, this study failed to support the second hypothesis. It did not find a significant effect of demographic characteristics on pregnant women's perceived importance. This differs from some studies that have suggested that age and education level may influence pregnant women's perception of pregnancy risks (Correa-de-Araujo & Yoon, 2021; Saccone et al., 2022). This result may be due to the relative homogeneity of the sample characteristics. Community education on dengue prevention measures and practices was conducted among pregnant women in Selangor, Malaysia (Khalil, Eittah, Elbastawesy, Mohamed, & Elkashif, 2024). Pregnant women may have received more consistent knowledge about mosquito infestations through prenatal care, community health education, or the mass media, thereby reducing the impact of demographic differences. Moreover, the single study location and highly homogeneous population may have hindered the detection of differences. Research collecting data in Selangor, Malaysia, suggests that respondents in this region have sufficient knowledge, attitudes, and preventive measures regarding mosquito-borne diseases (Othman et al., 2019). All respondents in this study were from the HTAR in Selangor, Malaysia, where mosquito risk education coverage may be relatively high. As well, the limited sample size (n=100) may not be sufficient to detect small differences. Notably, education level approached statistical significance (p=0.059), suggesting that it may still play a role in pregnant women's health risk perceptions.

Overall, the findings of this study highlight the consistency of pregnant women's perceptions of mosquito infestation in hospitals and provide valuable insights for public health interventions. Future policies and awareness campaigns could, alongside comprehensive sexual health education, further address potential differences in risk perceptions due to educational disparities, thereby more specifically enhancing pregnant women's understanding of and ability to cope with mosquito infestation risks during pregnancy. This also raises the bar for hospital obstetric departments to implement measures to reduce mosquito infestation risks.

6. CONCLUSION

This study targeted pregnant women in Selangor, Malaysia, and employed a questionnaire survey to comprehensively examine their perceptions of the importance of reducing mosquito infestation in hospitals, as well as the influence of demographic characteristics on such perceptions. The results showed that pregnant women generally believed that reducing mosquito infestation in hospitals was "very important," confirming Hypothesis 1 (H1). This finding highlights the high sensitivity of pregnant women to the health risks of mosquito infestation in hospitals,

suggesting that mosquito infestation during prenatal checkups and childbirth is widely recognized as a significant health issue among pregnant women. However, Hypothesis 2 (H2) was not supported, as demographic characteristics (age, gravidity, stage of pregnancy, and education level) did not significantly influence risk perceptions among pregnant women. This suggests that pregnant women exhibited strong consistency in their risk perceptions, potentially reflecting the widespread coverage and effectiveness of public health outreach for pregnant women in the region.

From a practical perspective, the results of this study suggest that controlling the risk of mosquito infestation in hospitals can be implemented for pregnant women as a whole, without overly differentiating between different demographic backgrounds. However, the results for education level were close to significance, suggesting that it may play a role in pregnant women's perception of mosquito infestation risk in hospitals. Future studies can further verify this with larger samples and a wider population. In addition, limitations of this study include the small sample size and single data source. Subsequent research could incorporate longitudinal designs and multi-hospital comparisons. Overall, this study reveals the high level of awareness of mosquito infestation among pregnant women in hospitals, providing valuable empirical evidence for the development of mosquito prevention measures and public health interventions in hospitals.

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Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
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