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Contraceptive Knowledge and Attitude of Sabah Married Women

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ABSTRACT

Background: An unplanned pregnancy was identified as a major public health concern worldwide in developed and developing countries. Since nurses are frontline healthcare providers of reproductive health counselling in Malaysia, the present study evaluated the level of knowledge and attitude toward contraception among married women in Sabah, Malaysia. **Methods:** A cross-sectional study was conducted among 254 women who resided in the Interior and West Coast Division of Sabah, Malaysia. Knowledge and attitude on the contraceptive questionnaire were administered to participants via convenience sampling. The instruments had high level of reliability, with a Cronbach's alpha coefficient of 0.73 for both knowledge and attitude. **Results:** The participants' mean age was 35.20 7.189 years. Most respondents (n=92, 36.2%) had poor knowledge of contraceptives, while (n=162, 63.8%) showed a satisfactory attitude towards contraception. Age group, residential address, monthly income, and number of children were significantly associated with women's knowledge level (p>0.05). Meanwhile, the monthly income and number of children were significantly associated with attitude level of women residing in Sabah (p<0.05). **Conclusion:** A worryingly high percentage of women in Sabah demonstrated poor knowledge, despite showing a satisfactory attitude. This crucial information can guide targeted interventions to improve contraceptive awareness and uptake. Community health nurse and nurse-midwives can leverage these findings to design targeted, culturally sensitive education and counselling interventions, particularly for lower-income, multiparous, and rural women, to improve contraceptive literacy and uptake.

Keywords: Attitude; Contraceptive; Knowledge; Women

INTRODUCTION

Community health nurses and nurse-midwives, who constitute the frontline of reproductive health services in Malaysia, are uniquely positioned to reduce the burden of unplanned pregnancy, a problem that remains a significant global public health concern because of its adverse consequences for mothers and children (Yusof *et al*., 2018). Abortions accounted for the largest proportion of hospital admissions for gynaecological services in developing countries, impacting many hospital resources (Lasimbang *et al.*, 2018; Population Reference Bureau, 2021; WHO, 2023). According to the Technical Report of the National Health and Morbidity Survey (NHMS) 2022: Maternal and Child Health in Malaysia, the current contraceptive prevalence rate in 2022 was 42.8%. 34.5% of respondents reported taking modern contraceptives, while 26.7% had unmet family planning needs. Furthermore, the report found that 51.6% of the need for family planning was met by modern contraception, but 33.0% of respondents had unintended pregnancies (NHMS, 2022; Binti Salim, 2022; Kassim & Ndumbaro, 2022).

The health situation of mothers and children can be much improved by arming women and their spouses with the knowledge and encouragement needed to plan their families. Family planning was particularly important in Malaysia, where many individuals lack adequate access to reproductive-health services (Askew *et al*., 2023). If a woman gets pregnant too early, too late, or too close together, it can affect a woman's health and well-being. By implementing family planning methods, one can therefore avoid unintended pregnancies, minimise infant deaths, lower the risk of sexually transmitted diseases and control rapid population growth.

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Due to this, women should learn about the different kinds of birth control before picking the one that works best for them (Bradshaw *et al*., 2023). Therefore, women should be equipped with knowledge of contraception before choosing which contraceptive method they would prefer (Sheng *et al.*, 2024). The study reported that 153 (60.95%) out of 251 participants in their study had poor knowledge of contraception, and only 98 (39.0%) had good knowledge (Nachimuthu, Devi & Karunanithi, 2022). The majority of the participants have heard of various contraceptive methods, including condoms, oral contraceptive pills, and injectable DepoProvera (Hassan, Manaf & Ismail, 2019; Nachimuthu, Devi & Karunanithi, 2022; Sheng *et al*., 2024). The main reason why they were unaware of contraception was because there needed to be a source of information on family planning.

Sabah had the highest prevalence of unwanted pregnancies among other Malaysian states. A combination of socio-economic, cultural, and healthcare-related factors contributes to the high prevalence of unwanted pregnancies in Sabah compared to other states in Malaysia. Sabah faces geographical challenges due to its rural and remote areas, making healthcare access more difficult. Lasimbang *et al.* (2018) investigated regarding contraceptive-related knowledge, attitude, and practice among Doctors and Women in Kota Kinabalu, Sabah. Their findings highlighted a significant gap in contraceptive utilisation, primarily due to concerns regarding side effects and prevailing cultural attitudes towards family planning. Limited healthcare infrastructure and resources in these areas often restrict the availability of contraceptives and family planning services. Women in these areas may have to travel long distances to access clinics, which can discourage regular use of contraceptives. Thus, although a majority of women were aware of contraception, their practical knowledge and application were notably restricted. Education levels are generally lower in some parts of Sabah, particularly in rural areas, which can correlate with reduced understanding of reproductive health. As frontline healthcare providers, nurses assess clients' reproductive health needs, address misconceptions, and provide customised guidance on various contraceptive methods to empower informed decision-making. Therefore, this study aims to evaluate the knowledge and attitudes regarding contraception among married women in Sabah, Malaysia.

METHODOLOGY

Study Design

This cross-sectional study was conducted in the Interior Division and the West Coast Division of Sabah, Borneo Island, Malaysia. In designing and reporting it, the authors adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement (Von Elm *et al*., 2007).

Setting and Population

A convenience sample of 254 women was recruited to participate in the study. Data collection occurred from November to December 2022. Women who are legally married or in a consensual union, aged 18 to 49 years (reproductive age), capable of understanding and communicating in Malay or English, and who have resided in the Interior Division or West Coast Division of Sabah for a minimum of 6 months were included in this study; however, individuals who had attained menopause were excluded from the study. The total number of women in the Interior Division and the West Coast Division was sourced from the Department of Statistics Malaysia, utilising the 2022 Key Population Statistics by Administrative District in Sabah. The total number of women in the Interior and West Coast Divisions of Sabah was 194,400 and 368,300, respectively (Department of Statistics, Malaysia, 2022). A total population of 562,700 across both divisions resulted in the selection of 254 respondents using Raosoft software Calculator (Raosoft, 2004).

Research Instruments

The study utilised three data collection instruments: A 'Personal Information Form' to gather demographic characteristics of patients and knowledge and attitude assessments, which were adapted with permission from Alina at Hospital University Sains Malaysia (HUSM), Kelantan, Malaysia (Alina *et al.*, 2006).

The 'Personal Information Form' collects demographic data, including age, religion, ethnicity, current residential address, education level, average monthly income, and number of children.

The section assessing knowledge level comprised 15 items. This section evaluated the participants'

knowledge regarding contraception, adapted from Alina *et al*. (2006). Categorical responses of 'true', 'false', or 'unknown' were designated for each item. Correct answers received a score of 2 marks, incorrect answers received 0 marks, and responses indicating 'don't know' received one mark. The total scores were converted into percentages by dividing them by the maximum possible score and multiplying by 100. The researcher classified knowledge levels as follows: a percentage score below 75% indicates poor knowledge, scores between 75% and 80% reflect moderate knowledge, and scores exceeding 80% denote good knowledge.

The attitude level measurement comprised eight items. This section evaluated the participants' attitudes toward contraception, an adapted study from Alina *et al.* (2006). A 5-point Likert scale was employed for respondents to evaluate each item based on their level of agreement. Responses were categorised as follows: Strongly agreed received a score of 5; 'slightly agreed' received a score of 4; 'neutral' received a score of 3; 'slightly disagreed' received a score of 2; and 'strongly disagreed' received a score of 1. The total scores were summed and converted into a percentage by dividing the score by the maximum possible score and multiplying by 100. The researcher defined a percentage score below 85% as indicative of an unsatisfactory attitude level, while a score of 85% or above was classified as satisfactory. To ensure the quality and relevance of the questions for women, face validity was assessed by three experts: medical lecturers from the Department of Obstetrics and Gynaecology, a senior lecturer from the Department of Nursing Science, and a nurse manager from the antenatal ward.

The 30 women for the pilot study were selected from Kota Belud district in the West Coast Division of Sabah using a convenience sampling technique. These areas were chosen to ensure that the pilot study participants had characteristics similar to the target population in the main study. Extant literature suggests that a pilot study sample should be 10% of the sample projected for the larger main study, which means at least 30 to 50 people (Connelly, 2008). Therefore, the thirty women with characteristics similar to the study sample were invited to participate in a pilot study to assess the reliability and suitability of the instrument, employing Cronbach's alpha coefficient. In this study, the internal consistency reliability of Cronbach's alpha for knowledge and attitudes among women residing in Sabah was 0.73 for knowledge scores and 0.73 for attitude scores. The questionnaires remained unchanged due to the sufficient reliability established in the pilot study.

Data Collection

The questionnaire was conducted online using Google Forms between November and December 2022. Prior to completing the questionnaire, participants received an information sheet detailing the study's objectives, a concise overview of the topic, the study procedure, participation requirements, potential benefits and risks, confidentiality assurances, and contact information for the researcher, supervisor, and research ethics committee. A consent form is included and must be completed prior to answering the questionnaire.

Ethical Consideration

Ethical approval for this study was obtained from the Medical Research Ethics Committee (UMREC) of University Malaya Medical Centre, Kuala Lumpur, Malaysia with reference number UM.TNC2/UMREC_1980 on 21st July 2022.

Data Analysis

All statistical analyses were conducted via SPSS Software Version 23.0 (IBM Corp., Armonk, NY, USA). The frequencies and significance of knowledge, attitudes and sociodemographic characteristics were individually calculated through the Chi-square test for dichotomous variables with a p-value less than 0.05 indicating statistical significance. Quantitative variables were expressed as mean and standard deviation.

RESULTS

A total of 384 participants were targeted for this study; 254 responded. Hence, a 66% response rate was yielded in this study. The main factor is the relatively low possible lack of participation due to the online administration of questionnaires. Some participants were not very happy to be questioned about their knowledge of family planning.

Sociodemographic Characteristics

The respondents' distribution of demographic characteristics is presented in Table 1. The age distribution

was between 18 and 49 years old, with the average age of the participants being 35.20 ± 7.189 years old. It also showed that most participants were Christian (74.8%). Regarding ethnicity, Sabah Bumiputera respondents occupied 72.8%; 48% of the respondents resided in the West Coast Division of Sabah, while 52% lived in the Interior Division. More than half of the respondents have attained their tertiary education 67.7% and 31.5% had secondary education, and only 0.8% had primary education. Regarding the respondents' average monthly income, 14.2% made less than USD223.85, 26.8% made USD223.85 to USD671.33, 36.2% made USD671.40 to USD1,118.78, and 22.8% made USD1,119.25 and above. Many of the respondents had more than two to three children.

Table 1: Sociodemographic Characteristics of Respondents (n=254)

Characteristics	Frequency(n)	Percent (%)	Mean (SD)	Range
Age				
29 and below	57	22.4	35.20	18-49
30-39	111	43.7	(7.189)	
40 and above	86	33.9		
Religion				
Islam	52	20.5		
Christianity	190	74.8		
Buddhism	10	3.9		
Hinduism	2	0.8		
Ethnicity				
Malay	17	6.7		
Chinese	25	9.8		
Indian	2	0.8		
Sabah Bumiputera	185	72.8		
Sarawak Bumiputera	14	5.5		
Others[a]	11	4.3		
Residential Address				
West Coast Division	122	48		
Interior Division	132	52		
Education Level				
Primary	2	0.8		
Secondary	80	31.5		
Tertiary	172	67.7		
Average Monthly Income				
< USD223.29	36	14.2		
USD223.29 – USD671.776	68	26.8		
USD671.776– USD1119.776	92	36.2		
≥ USD1120	58	22.8		
No. of Children				
None	42	16.5		
1-2	110	43.3		
3 and above	102	40.2		

Note. a include Bruneian Malay, Visayan, and Toraja ethnic groups

Knowledge and Attitudes items on contraceptives

Women demonstrate the highest understanding of condoms as a sheath composed of soft rubber material (1.94±0.24). This is followed by their knowledge of the calendar method to prevent unprotected sexual intercourse during the fertile period to avoid pregnancy (1.91±0.37). Conversely, they demonstrated the least comprehension regarding the increased risk of premature birth in pregnant women with a birth interval exceeding 5 years (0.72±0.72). The majority of women indicated that new mothers and their husbands should receive adequate information regarding family planning (4.72±0.47). Additionally, respondents reported a lack

of knowledge about the greater effectiveness of modern contraceptive methods compared to traditional methods (4.05±0.87) (Table 2).

Table 2: Knowledge and Attitude Score on Contraception (n=254)

Variables	Mean ± SD
Knowledge Item on Contraception	
Birth spacing which is the period between the birth of a baby to the next pregnancy, that is too close or too far apart will cause harm to the born baby.	1.46 ± 0.79
Pregnant mothers with birth spacing of less than two years are considered as high-risk pregnancy.	1.54 ±0.78
Pregnant mothers with birth spacing of more than 5 years are at higher risk of delivering a premature baby.	0.72 ± 0.72
A birth spacing that is too close does not allow the mother's body to provide enough nutrition to the foetus.	1.62 ± 0.71
Per vaginal bleeding during pregnancy may happen to mothers with too short birth spacing.	1.56 ± 0.65
The most suitable age for woman to have a baby is between 20 to 35 years old.	1.89 ± 0.42
Age of a woman is an important factor in determining the suitable type of contraception to be used.	1.41 ± 0.78
Oral contraception pill is contraindicated for a woman who has breast cancer.	1.30 ± 0.62
Injectable contraceptionis administered every 2 to 3 months depending on its type.	1.69 ± 0.47
Intrauterine Contraceptive Device(IUD) is made of plastic with various shapes and sizes.	1.17 ± 0.72
Condom is a sheath made from a soft rubber material.	1.94 ± 0.24
The use of condoms mayprovide protection against sexuallytransmitted diseases suchas AIDS.	1.73 ± 0.60
Condom must be removed immediatelyafter ejaculation when penis is erected.	1.39 ± 0.68
A woman may use a calendar method to avoid unprotected sexual intercourse during her fertile period to prevent pregnancy.	1.91± 0.37
During ovulation (fertileperiod), a woman willhave a vaginal dischargewhich is colourless and smooth.	1.82 ± 0.48
Attitude Item on Contraception	
Pregnancy must be properly planned and not just allow it to happen on its own.	4.57 ± 0.75
A mother who has just delivered and her husband should be given adequate information regarding family planning.	4.72 ± 0.47
Pregnancy should be planned and discussed together between husband and wife.	4.67 ± 0.60
Pregnancy that is too closely spaced should be avoided by using family planning methods.	4.43 ± 0.811
Husband should be involved during the planning and ensuring the use of contraceptive by hiswife.	4.71 ± 0.52
Modern contraceptive method is more effective than traditional method.	4.05 ± 0.87
The use of contraceptive methods will not interfere with sexual relationships between husband and wife.	4.14 ± 1.00
Support from family and the community is important to determine the success of family planning programme.	4.55 ± 0.75

Description of Total Knowledge and Attitude Level on Contraception

Table 3 presents the overall knowledge level regarding contraception among the respondents. The highest possible score for knowledge regarding contraception was 30. Additionally, the lowest score recorded was 13. The average total knowledge level regarding contraception was 23.14 with a standard deviation of 3.83. The total knowledge score of the respondents was calculated by dividing the score by 30 and then multiplying the result by 100 to express it as a percentage. Respondents scoring below 75% exhibited poor knowledge; those scoring between 75% and 80% demonstrated moderate knowledge, while scores exceeding 80% indicated a good knowledge level. This study indicates that a majority of respondents exhibit a poor level of knowledge regarding contraception, with 102 individuals (40.2%) classified as having poor knowledge, 92 individuals (36.2%) classified as having good knowledge, and 60 individuals (23.6%) classified as having moderate knowledge.

The highest possible score for the respondents' attitude level on contraception was 40. The minimum score recorded was 17. The average total attitude level regarding contraception was 35.84 with a standard deviation of 3.85. The attitude level was categorised into two distinct levels, satisfactory and unsatisfactory. The total attitude score of the respondent was calculated by summing the individual scores, dividing by 40, and then multiplying by 100 to express it as a percentage. Respondents achieving scores of 85% or higher exhibited a satisfactory attitude towards contraception. Respondents with scores below 85% were classified as exhibiting unsatisfactory attitudes towards contraception. In this study, 162 participants (63.8%) exhibited a satisfactory attitude towards contraception, whereas 92 participants (36.2%) demonstrated an unsatisfactory attitude.

Table 3: Total Knowledge Level on Contraception (n=254)

Knowledge Level	n (%)
Good	92 (36.2)
Moderate	60 (23.6)
Poor	102 (40.2)
Attitude Level	
Satisfactory	162 (63.8)
Unsatisfactory	92 (36.2)

Association between women's sociodemographic characteristics and the Level of Knowledge and Attitude on Contraception

Table 4 presents the results of the Chi-Square test of independence, analysing the association between selected sociodemographic variables and the overall knowledge and attitude levels toward contraception among respondents. The analysis of sociodemographic characteristics indicated that age and residential address did not significantly affect the level of knowledge among women residing in Sabah ($p>0.05$), except for monthly income and number of children.

The majority of respondents, 34 (37%), demonstrated good knowledge and reported a monthly income ranging from RM 3,000 and RM 4,999. Finally, a statistical association was observed between knowledge levels and monthly income regarding contraception among women in Sabah, X^2 (6, N=254) = 19.02, p = 0.004 (p<0.05). Furthermore, most respondents (52; 56.5%) exhibited a moderate level of knowledge, particularly those with three or more children. Additionally, all participants with a strong understanding of contraception did not have children (102;100%). This indicates that individuals without children may possess a strong understanding of contraception. A statistical association was observed between knowledge levels and the number of children using contraception among women in Sabah, X^2 (4, N=254) = 12.79, p = 0.012 (p<0.05).

In addition to examining the relationship between specific socio-demographic characteristics of respondents and their overall knowledge level, a chi-square test was conducted to assess the total attitude level as well. A statistical association was observed between the overall attitude level and the selected variables: age, residential address, monthly income, and number of children (p<0.05). Given that $p < 0.05$, the null hypothesis is rejected.

Table 4: Association between Women's Sociodemographic Characteristics and the Level of Knowledge and Attitude on Contraception (n=254)

Characteristics	Total Knowledge Level n (%)			*p*-value	Total Attitude Level n (%)		*p*-value*
	Poor	Moderate	Good		Satisfactory	Unsatisfactory	
Age Group							
29 and below	23 (22.5)	13 (21.7)	21 (22.8)	0.47	51 (27.7)	6 (8.6)	<.001
30-39	41 (40.2)	32 (53.3)	38 (41.3)		83 (45.1)	28 (40)	
40 and above	38 (37.3)	15 (25)	33 (35.9)		50 (27.2)	36 (51.4)	
Residential Address							
Interior Division	56 (54.9)	32 (53.3)	44 (47.8)	0.6	84 (45.7)	48 (68.6)	0.011
West Coast Division	46 (45.1)	28 (46.7)	48 (52.2)		100 (54.3)	22 (31.4)	
Monthly Income							
< USD223.29	18 (17.6)	10 (16.7)	8 (8.7)	0.004	24 (13)	12 (17.1)	0.035
USD223.29–USD671.776	28 (27.5)	10 (16.7)	30 (32.6)		48 (26.1)	20 (28.6)	
USD671.776–USD1119.776	26 (25.5)	32 (53.3)	34 (37)		76 (41.3)	16 (22.9)	
≥ USD1120	30 (29.4)	8 (13.3)	20 (34)		36 (19.6)	22 (31.4)	
No. of Children							
None	20 (19.6)	14 (23.3)	46 (45.1)	0.012	34 (18.5)	8 (11.4)	0.003
1-2	36 (35.3)	22 (36.7)	24 (40)		88 (47.8)	22 (31.4)	
3 and above	46 (45.1)	52 (56.5)	32 (34.8)		62 (33.7)	40 (57.1)	

**Statistically significance at p<0.05*

DISCUSSION

In this study, the degree of awareness about contraception among women in Sabah was low, with 102 (40.2%) of a total of 254 respondents having poor understanding. This finding was similar to the study conducted by Nachimuthu, Devi and Karunanithi (2022), where 153 (60.95%) out of 251 participants had poor knowledge. This was possibly due to the lack of exposure to education with regard to family planning. The previous study was conducted during the Conditional Movement Control Order (CMCO) implementation. Hence, visits to the maternal and child health clinic were probably reduced. Similarly, the current study was conducted during the COVID-19 pandemic. Thus, respondents' exposure to the family planning programme was reduced due to self-isolation at home. A study among communities of the Fentale district, Eastern Ethiopia, showed 94.2% never discussed family planning, and only 27.4% used any form of family planning, with 18.2% opting for modern methods (Beyene, Garoma & Belachew, 2025). Not having a source of information on family planning was the main reason in this previous study, which comprised 60.18% of the total participants (Binu *et al*., 2021). However, a different study conducted by Lee *et al*. (2019) revealed that the participants in the study had good knowledge regarding family planning. This was probably due to the fact that the study was conducted in Petaling, which was regarded as a district with a higher level of urbanisation. Thus, education with regard to contraception may have been more widespread as compared to Sabah.

Favourable attitudes towards contraception are generally reported in studies with contraceptive knowledge and attitudes comparable to the current findings (Yusoff *et al.*, 2022; Nachimuthu, Devi & Karunanithi, 2022; Alkalash *et al.*, 2023; Zulfakar, Islahudin & Punniaseelan, 2023; Beyene, Garoma & Belachew, 2025). The majority of participants had a satisfactory opinion towards contraception (162 participants, 63.8%), while 92 participants (36.2%) had an unsatisfactory attitude. Almost 85% of the participants from Al-Qunfudah Governorate, Saudi Arabia, showed a positive attitude toward contraceptive use, and the most commonly used contraceptives are contraceptive pills (32.39%) and IUDs (29.95%) (Alkalash *et al*., 2023). This finding was possibly caused by active sexual activity among the respondents. Hence, contraceptives were viewed with a positive attitude to prevent unplanned pregnancy and high-risk abortions. Similar to the current study, the majority of the respondents strongly agreed (178; 70.1%) with the statement, "Pregnancy must be planned and not just allow it to happen on its own." The respondents showed a similar understanding that contraceptives were important in planning pregnancy. In contrast, Zulfakar, Islahudin and Punniaseelan (2023) reported that the overall contraceptive attitude among the study population remained poor. One contributing element to the negative attitude could be the Malaysian community's sensitivity to sexual-related topics, which creates numerous barriers to accessing sexual and reproductive health information, support, and practices.

In this study, a statistical association was found between selected sociodemographic variables and the total level of knowledge (age group, residential address, monthly income, number of children) and the total level of attitude (monthly income and number of children). In a previous study by Yusoff *et al*. (2022), there was a statistical association found between knowledge, attitude, and practice towards family planning and age, marital status, employment, yearly income, education level, ethnicity, and religion. One of the few reasons for these associations was that women with a stable income may be able to access quality family planning. Besides that, women who had attained a higher education level were exposed more to knowledge regarding sexual and reproductive health as compared to those who only reached a lower education level. In this current study, women in the age group of 30-39 years old had the best knowledge level. According to Sherpa, Sheilini and Nayak (2013), a significant association was found between the level of knowledge about contraception and the level of education, occupation, monthly household income, and duration of marriage. Similar study findings from Zelalem *et al*. (2021) reported that socio-economic and demographic variables such as the religion of couples, the number of couples' living children, monthly income, couples' family planning approval and women's counselling about family planning by health workers were significantly associated with current modern contraceptive use. Spousal family planning communication plays an important role in making better reproductive health decisions and in increasing the use of modern contraceptive methods. Those who were able to provide a monthly income of USD 59.17 were able to obtain

better family planning services. Similarly, in this study, those with a monthly income of USD 671.40 to USD 1,118.78 had the most satisfactory attitude towards contraception.

Knowledge on contraception among women in Sabah was assessed through this study and it was found to be poor. Unmet family planning needs are prevalent in Malaysia and associated with specific of women of reproductive groups (Wan Jusoh *et al.*, 2025). Nurses should take action to educate women on the several types of contraception, purpose of contraception, common side effects of contraception, risk and benefit of contraception, and the proper way of using a contraceptive method. Even though most of the respondents were satisfied with contraception use, this does not indicate good practice. Sexual and reproductive health services are currently provided by both government and private sector. Plus, free or even cheaper cost were provided in the government hospital and health clinics for women who wanted to obtain contraceptives. Yet, there were still who were unaware regarding where to get their contraceptives and sexual and reproductive health services. Women ended up having unplanned pregnancies due to poor practice in contraception. Thus, nurses should play a role in educating women about contraception.

Limitation

The study includes a few limitations that should be considered. The conclusion was derived from a convenience sampling method representing solely the Interior and West Coast Division of Sabah. Cultural attitudes and societal conventions in Sabah may have affected participants' readiness to openly disclose contraceptive use, perhaps resulting in response bias or underreporting. The findings may not be applicable to the entire population of Sabah. Talking about birth control might have been frowned upon for certain women because of religious or traditional views. For example, some women may be hesitant to reveal they use contraception for fear of being judged by the community or being disapproved of by elders. As a result, participants may either have avoided answering truthfully or underreported their contraceptive use, thus biasing the study's findings.

CONCLUSION

This study exposes a substantial deficit in contraceptive knowledge and favourable attitudes among women in Sabah. Since safe, voluntary family planning is central to gender equality, women's empowerment, and poverty reduction, addressing this gap is a public-health imperative. Early and targeted education—particularly through culturally sensitive counselling delivered by nurses, mobile clinics, and community-health-worker outreach—offers the most direct route to improved birth spacing and reduced maternal and infant mortality.

To sustain progress, future research should expand its geographic scope to include women from other Malaysian regions in order to better capture national diversity. Longitudinal tracking of participant cohorts would help determine whether improvements in knowledge and behaviour are lasting. Additionally, leveraging phased policy implementations as natural experiments can help quantify the long-term health and economic impacts of contraceptive education and access. Integrating quantitative surveys with qualitative interviews will further enrich understanding of the socio-cultural factors that influence contraceptive decision-making. Finally, rigorous trials of nurse-led interventions are essential to confirm both their cost-effectiveness and scalability. Together, these steps will ensure the current findings translate into tangible, nationwide improvements in reproductive health.

Conflict of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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