

Exploring the determinants of family planning practices among women with diabetes and no pregnancy intention in Malaysia: women's voices

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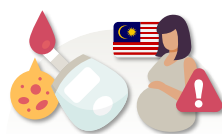
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Exploring the determinants of family planning practices among women with diabetes and no pregnancy intention in Malaysia: the women's voices



Background & aim



- Women with diabetes are at higher risk for adverse pregnancy outcomes
- Despite this, contraceptive use remains low

To explore the determinants of contraceptive practices among multi-ethnic women with diabetes in Malaysia

Methods



1
Qualitative,
explorative study



2
Semistructured
interviews



3
Thematic analysis
of interview
transcripts

Key findings

Health concerns



- Fear of complications and medication side effects

Perceived pregnancy susceptibility



- Low perceived risk of conception

Knowledge gaps



- Limited awareness of contraceptive methods and fertility

Sociocultural norms



- Influence of beliefs, family, and religion on decisions

Conclusion

Targeted education and culturally sensitive counseling are vital to improve contraceptive uptake

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ABSTRACT

Background: Contraception is essential for women with diabetes to reduce adverse pregnancy outcomes. However, the contraception rate among this high-risk group remains low. This study explored the determinants of contraceptive practices among multi-ethnic Asian women with diabetes.

Methods: This exploratory qualitative study on the preconception care of multi-ethnic, reproductive-age women with diabetes was conducted at four public health clinics in Negeri Sembilan, Malaysia. Semi-structured, in-depth interviews were conducted, audio-recorded, and transcribed. An interpretive thematic analysis was performed on data regarding contraception among 19 women who expressed no desire for pregnancy.

Results: Health concerns, perceived susceptibility to pregnancy, lack of knowledge regarding contraception and conception, and prevailing pregnancy norms influenced contraceptive practices. Many factors affecting pregnancy planning were unrelated to diabetes, such as perceived pregnancy susceptibility, religious orientation, societal norms, husband's preferences, and inadequate contraception knowledge.

Conclusion: Family planning and reproductive health must be included in routine clinical consultations for women with diabetes. While this study re-emphasizes the influence of diabetes on women's decisions to use contraception, their choices are also shaped by personal and social factors. Healthcare providers must adopt a more open approach toward women's perspectives on pregnancy planning and further explore their values and underlying issues to promote effective contraception, considering the benefits.

Keywords: Diabetes Mellitus; Contraception Behavior; Doctor Patient Relation; Religion

Introduction

Diabetes in pregnancy (DIP) significantly impacts pregnancy outcomes. In Malaysia, pregnancy rates among women with pre-gestational diabetes (PGD) increased from 0.24% in 2016 to 0.43% in 2018 [1]. Approximately 10% of DIP cases result in congenital malformations, particularly when glucose levels are poorly controlled [2]. In Malaysia, the prevalence of DIP-related stillbirths rose from 7.55 per 1,000 births in 2013 to 19.6 per 1,000 births in 2015 [3]. Therefore, women with PGD must achieve optimal diabetes control before pregnancy to ensure favorable outcomes. An important strategy to reduce adverse health outcomes associated with DIP is adequate pregnancy planning [4]. In planning for pregnancy, it is essential to address contraceptive needs [5] to prevent unplanned pregnancies or to allow time for diabetes optimization before conception [6]. However, women with diabetes often do not use contraception [6,7]. Among those who do, only 37.6% have used effective contraception, while 62.4% have either used less effective methods or no contraception at all [6].

Contraceptive practice is a complex, multifactorial process. There are many reasons why women with diabetes may not use contraception. Although diabetes increases the risk of poor pregnancy outcomes, conception may still be seen as socially essential for some women and their families; some are pressured by their families to conceive despite the risks [8]. Moreover, diabetes carries a substantial risk of infertility, which may further heighten the perceived urgency to procreate. Religion and culture have also been shown to influence modern contraceptive practices [9]. Other determinants include access to and knowledge of contraception, societal influences, and personal beliefs [7-10]. In Malaysia, the contraception rate among women with diabetes who do not intend to conceive is 35% [11], which is lower than the national contraceptive acceptance rate of 55% [12]. However, there is limited

in-depth understanding of the determinants of contraception among these women. This study aimed to explore, in depth, the determinants of contraceptive practice among women with diabetes who do not intend to conceive.

Methods

Study design and participants

A qualitative research design was used to explore the determinants of contraception use among women with diabetes. In this study, purposive sampling was used to capture diverse perspectives. Participants were recruited from reproductive-age women with type 2 diabetes belonging to the three major ethnic groups in Malaysia—Malay, Chinese, and Indian—all of whom had no intention of becoming pregnant within the next year, regardless of their contraception use. Parity and the latest glucose levels were also considered when selecting participants. These three ethnic groups represent Malaysia's diverse population and differ in religious and cultural practices. Participants were recruited from four government primary care clinics located in the southwestern region of Peninsular Malaysia. Two clinics were situated in urban areas and two in rural areas to explore whether locality influenced perspectives. All participants were identified through the clinics' diabetic appointment lists. This state was selected because it has the highest prevalence of diabetes in the country [13]. Women were excluded if they had a strong pregnancy intention or ambivalence toward pregnancy, had attained menopause, had no live-in partner, were unable to converse in either Bahasa Malaysia or English, had psychiatric disorders with acute psychotic or cognitive symptoms, or were cognitively unstable during the interview.

Data collection

Participants who fulfilled the inclusion criteria for purposive sampling were invited to participate in a face-to-face, in-depth interview (IDI) during their clinic appointments. Before the interview, participants were required to complete a data collection form covering socio-demographic information and contraceptive practices. The latest blood glucose levels were obtained from their diabetic clinical records. Good glucose control was defined as an hemoglobin A1c level of 6.5%, a fasting glucose level of <6.0 mmol/L, and a random glucose level of <8.0 mmol/L within the past 3 months.

The IDIs were conducted by a single researcher (I.Z.I.), a female Family Medicine Specialist (FMS) trained in qualitative research, who had no prior professional involvement at the study sites. Each interview lasted between 40 and 60 minutes. The first author (I.Z.I.) introduced herself as a researcher to the participants at the beginning of each interview. Prior to data collection, discussions were held with other FMS to better understand the service context and to address any potential biases or preconceived notions the research team might have had during the development of the topic guide.

The interviews were guided by a semistructured topic guide (Table 1, Supplement 1), which was developed based on the theory of planned behavior (TPB) [14]. It covered three key aspects of contraceptive practice among women with diabetes: current contraceptive methods, perceptions of current contraceptive practices, and experiences with contraception, including facilitators and barriers.

Ethical consideration

Ethical approval was obtained from the Medical Research Ethics Committee (NMRR-17-1613-36439). Participants, identified by assigned pseudonyms, were briefed on the study protocol using an information sheet, and both verbal and written informed

consent were obtained for the interview audio recordings and observations.

Data analysis

Data transcription and analysis were conducted after each interview. Interview recordings were transcribed verbatim and anonymized. Data management and coding were performed using NVivo ver. 10.0 (QSR International), a qualitative data analysis software. The research team (I.Z.I., C.J.N., P.Y.L., N.H.) independently analyzed the first three transcripts using a thematic approach [15]. I.Z.I. continued the analysis for the remaining transcripts. All team members were experienced qualitative researchers. An inductive strategy was employed: transcripts were coded line by line, with constant revisions to the coding scheme to ensure consistency across all transcripts. Codes were subsequently reorganized and grouped based on similar meanings and concepts to form the coding framework, which guided the analysis of the remaining transcripts. All codes were condensed into categories and themes. Regular meetings were held to discuss and re-examine the coding framework, categories, and thematic analysis, and any disagreements were resolved through consensus among all researchers. Observation field notes were also incorporated into the analysis to provide contextual information. However, intercoder reliability was not formally assessed. Data saturation was achieved with the 19th participant, when no new themes emerged. Transcripts were returned to six participants for member checking, and all participants agreed with the interpretation of their views. Throughout the research process, interviewer bias was minimized by the researcher maintaining a reflexivity journal and engaging in peer debriefing with the research team to ensure that data collection and analysis were not influenced by the researchers' identities, backgrounds, or personal interests. To ensure the quality of reporting for this article, the COREQ (Consolidated Criteria for Reporting Qualitative Research) checklist was followed.

Results

Nineteen participants were interviewed. Most participants had at least one living child and demonstrated poor glucose control. The participants' background data are presented in Table 2. Examples of effective and less effective contraception methods are provided by the World Health Organization on Family Planning/Contraceptive Methods [16]. Participants who were not using any contraception method were categorized as not using contraception.

Determinants of contraceptive practice

Four themes emerged regarding the factors influencing contraceptive practice among women with diabetes who had no

Table 1. Topic guide on contraceptive behavior among women with diabetes

Issue	Question
Diabetes status	How is your diabetes now?
Knowledge on diabetes and pregnancy	Do you know the effect of diabetes on pregnancy? What is your opinion on this?
Pregnancy planning	Have you any plans for pregnancy? If yes: what are your plans to conceive? What influence you to plan for pregnancy? If not: Are you using any contraceptive method?
Contraception	What is your opinion on contraception? Why do you use or not use contraception? How is the pregnancy protection from your current method?

Table 2. Participants' socio-demographic and clinical characteristics

Characteristic	No. of participants
Age (y)	
<40	14
≥40	5
Ethnicity	
Malay	10
Chinese	4
Indian	5
Parity	
Nulliparous	1
Multiparous	18
Contraception	
Using effective methods (hormonal contraception, intrauterine device, or abstinence)	9
Using less effective methods (condom, withdrawal, fertility counting, or traditional method)	7
Not using any contraception	3
Glycemic control	
Controlled glucose level	4
Uncontrolled glucose level	15

Table 3. Themes and their descriptions

Theme no.	Theme	Description
Theme 1	Health concerns • Effects of diabetes on pregnancy • Side effect of contraception	Concerns with ill effects of diabetes on pregnancy and side effect of contraception
Theme 2	Perceived pregnancy susceptibility • Infrequent sexual activity • Trust in current contraceptive methods	Perception of the ability to avoid pregnancy which influence their acceptance for contraception
Theme 3	Inadequate information on contraception • Inadequate knowledge in contraception • Inadequate healthcare providers engagement in contraception	Inadequate information on contraception due to the lack of knowledge regarding contraception and limited engagement women received from healthcare providers.
Theme 4	Pregnancy and contraception norm • Pregnancy is God's gifts, • Pregnancy planning is not a norm, • Husband is the decision-maker	Customary behaviors from internal and external influences, such as culture, religion, and people of importance, in relation to pregnancy and its relevance to contraceptive practice.

intention to conceive. The themes were (1) health concerns related to diabetes and side effects of contraception, (2) perceived susceptibility to pregnancy, (3) inadequate information regarding contraception, and (4) prevailing norms around pregnancy and contraception use. Table 3 summarizes the themes.

Theme 1: health concerns

The intention to use contraception was influenced by multiple health concerns, including the adverse effects of diabetes on pregnancy and concerns about the side effects of contraception.

Effects of diabetes on pregnancy

Participants expressed positive attitudes towards contraception, placing particular emphasis on avoiding pregnancy when their diabetes was poorly controlled. They were concerned about the harmful effects of diabetes on pregnancy outcomes. "I have

never been on contraception. Only now in my 40s, I'm on one. All because of diabetes (sigh). I'm worried about diabetes" [J, Malay, on IUD, poor glucose level control]. Additionally, participants expressed fears about the potential impact of diabetes on their offspring. The traumatic experience of losing an unborn child due to high glucose levels encouraged more receptive and diligent contraceptive practices. As a result, participants seemed to view effective contraception as a pragmatic means of protection against DIP complications; "I check my fertile period using a kit every day, so no intercourse during the fertile period. I still feel the trauma from having an ectopic pregnancy, but I think it's the diabetes" [N], Malay, abstinent during fertile period, poor glucose level control].

Effects of contraception

Participants also expressed concerns about the possible side effects of contraception. While traumatic obstetric experiences en-

couraged contraceptive acceptance, experiencing contraception-related side effects was seen as unacceptable; “I used the pills for a month, then stopped because my appetite increased. I was forever hungry, and my weight went up. So, I just use my own way” [NA, Malay, no contraception, good glucose level control]. Safety was a major concern for couples, significantly influencing contraceptive choices; “I had side effects from the IUD. I had prolonged bleeding and took a long time to recover. So, my husband said: ‘Don’t use the IUD anymore.’ He let me use this (depot)” [NS, Malay, on-depot provera, poor glucose level control].

Theme 2: perceived pregnancy susceptibility

This theme reflects the participants’ perceptions of their ability to avoid pregnancy, which influenced their acceptance of contraception.

Infrequent sexual activity

This finding suggests a misperception about reproduction. Participants believed that infrequent sexual activity acted as a form of contraception; therefore, using contraception did not seem relevant, as they perceived pregnancy to be unlikely; “Only occasionally do we have sex. Not every day. I’ve never thought about having another pregnancy anymore. (Probability) Pregnancy? I don’t know. My goodness; (it’s) scary... Don’t even think about it” [TBC, Chinese, no contraception, good glucose level control].

Trust in current contraceptive methods

Participants’ trust in their current contraceptive practices, particularly traditional methods, influenced their perceived susceptibility to pregnancy. Successful personal experience with these methods encouraged continued use. “Just make sure his semen doesn’t go in (after sex), lift your head and remove it (the semen). No other method. Been using it since my last child” [SA, Malay, traditional method, poor glucose level control]. Additionally, experiences shared by family members and friends regarding failed contraception heavily influenced participants’ choices. Negative stories discouraged them from using certain methods, regardless of scientific evidence: “For me, this (no contraception) is OK. Maybe from a medical point of view, we should be using more secure methods. But I don’t want to. I’ve seen friends who got pregnant even when they went for injections. My cousin too” [NT, Malay, no contraception, poor glucose level control].

Theme 3: inadequate information regarding contraception

Women’s misperceptions about contraceptive methods often stemmed from inadequate information, further compounded by a lack of engagement from healthcare providers (HCPs) regarding contraception.

Inadequate knowledge regarding contraception

Fear of the unknown deterred some women from using modern contraception. Participants expressed misperceptions about the mechanisms and effects of contraceptive methods, particularly regarding future fertility. Such misunderstandings significantly influenced their acceptance of effective contraception and their trust in traditional methods. “They told me to take contraceptive pills if I want to avoid pregnancy, but then I heard (concerned face and tone) maybe it would later be difficult for me to conceive. That is why I don’t want to take the pill” [NJ, Malay, abstinent during fertile period, poor glucose level control].

Inadequate HCPs’ engagement in contraception

While some participants had limited discussions about family planning with their HCPs, others had none. Unfortunately, when discussions did occur, they often failed to address participants’ concerns adequately, leading them to continue with their existing practices. “All the while, nobody has ever advised me on family planning... that is why I do it my own way. Ha ha... Nobody asked me to plan properly. So, I did it myself” [SA, Malay, traditional method, poor glucose level control].

Theme 4: pregnancy and contraception norms

Norms were defined as customary behaviors influenced by internal and external factors, such as culture, religion, and significant others, particularly in relation to pregnancy and its relevance to contraceptive practices.

Pregnancy is God’s gift

This subtheme highlights the strong belief among participants that religious views influenced their decision not to use contraception, especially when rationalizing unplanned pregnancies. Notably, women who did not use effective contraception exhibited more passive attitudes towards potential reproductive events. “Accidental pregnancy? Well, if I’m pregnant again, what more can I do? It’s God’s gift. Even my husband doesn’t mind; if there is none (pregnancy), it is fine. If there is, well, it’s rezeki (God’s gift)” [NA, Malay, no contraception, good glucose level control]. Participants often referred to unplanned pregnancy as fate and an act of God. Although other factors may have contributed to their passive stance on contraception, the findings imply that an unplanned pregnancy was not seen as an intolerable issue. “If I accidentally conceive, why shouldn’t I accept it? I have a husband. It is permissible by Allah (God), so I’m not afraid” [Z, Malay, no contraception, poor glucose level control].

Pregnancy planning is not the norm

Participants generally did not actively plan their pregnancies, nor did they feel that avoiding pregnancy was necessary. Pregnancy was perceived as a normal part of life, and participants accepted future events without deliberate reproductive planning,

even when they feared conceiving. “I am afraid to conceive because of the high risk. When it comes to babies, my husband and I have not thought about it anymore... well, if there is, then there is (shrugging her shoulders)” [T, Malay, no contraception, poor glucose level control]. The perception of “if there is, then there is” may also reflect a latent desire for pregnancy, despite an intellectual awareness of the associated risks.

Husband is the decision-maker

Husbands played a significant role in reproductive health decisions. It is socially acceptable for women to follow their husbands' preferences for contraceptive methods, even if they may not be pleased with their decision. This pattern persisted even among women with diabetes. Nonetheless, given the choice, some women indicated they would consider medical advice from doctors when selecting contraception. “Mmm... the doctors have advised me to take the pills. I'm OK... but the problem is that my husband only wants to use the withdrawal method (shrug)” [NA, Malay, withdrawal method, good glucose level control].

Discussion

This study identified several factors influencing contraceptive practices among women with diabetes who had no intention to conceive. The first key finding highlights the women's awareness of the adverse effects of diabetes on pregnancy. This was the only factor directly related to diabetes that positively influenced contraceptive practice in this study. Other findings underscored the challenges in accepting contraception despite a lack of pregnancy intention. The second key finding emphasizes perceived behavioral control over conception, while the third points to a deficiency in information transfer regarding contraception. The final key finding reflects how subjective and social norms surrounding pregnancy influence contraceptive practices.

In this study, women with diabetes expressed motivation to practice contraception due to concerns about diabetes. While this is not surprising given the known risks associated with DIP, it is noteworthy because it suggests that some women recognize the importance of effective contraception either for optimizing diabetes control before pregnancy or for avoiding pregnancy altogether. This finding supports the “control belief” element in the TPB: when women believe they can take actions to reduce the risk of poor pregnancy outcomes, they are more likely to engage in those actions [14]. However, this sentiment was not universal. Some women lacked a clear understanding of DIP and were unaware of the pregnancy complications associated with uncontrolled diabetes.

This study reiterates that women with diabetes have a gap in contraceptive knowledge [17,18]. Nonetheless, these women are not entirely devoid of contraceptive awareness. They appeared more comfortable relying on less effective contraceptive meth-

ods or not using any method at all, regardless of their diabetes control, either by choice or due to negative experiences with more effective methods, such as IUDs. They understood that having diabetes does not limit their contraceptive options, but they require detailed explanations of available methods to ensure their safety [11,19]. This study also revealed that the women harbored misperceptions about certain contraceptive methods and tended to avoid unfamiliar options or methods associated with unacceptable side effects. The use of contraception, particularly intrauterine devices, is further complicated by widespread myths and exaggerated reports of complications perpetuated through the media and even by healthcare practitioners [20]. This highlights the need for deeper engagement between HCPs and patients. As reported in other studies, the women in this study often did not recall any discussions about family planning with their HCPs [21-24]. Reproductive-age women with diabetes have been reported to receive less advice and fewer prescriptions for contraception compared to their nondiabetic counterparts [24]. The lack of contraceptive knowledge among healthcare providers and insufficient service provision have further exacerbated this problem [20]. Therefore, HCPs must be continuously educated to provide appropriate counselling for couples. Additionally, couples should be taught how to use contraceptive methods correctly; for instance, pregnancy protection rates increase from 87% to 98% when condoms are used consistently and properly [16]. Unfortunately, due to the high complexity of healthcare systems and time constraints, family planning discussions in busy diabetic clinics are often inconsistent [24]. Healthcare systems must incorporate structured platforms to enhance patient-HCP communication regarding contraception [8,23].

Inadequate knowledge regarding contraception may shape how women perceive their likelihood of conceiving. This finding reinforces the element of perceived relevance from the TPB, where behavioral intention is influenced by perceptions regarding factors that affect behavior performance [14]. In this study, women viewed infrequent sexual activity as a natural protection against pregnancy. Women are unlikely to consider contraception or be receptive to contraceptive methods if they do not perceive themselves as susceptible to conception. This misperception about fertility is common in Malaysia [10]. Infrequent sexual activity is among the most frequently cited reasons for not using contraceptives among married women, particularly in Asia [24]. These findings highlight the need for more personalized family planning management for women with diabetes.

A personalized approach should include the husband and take into account the wife's social norms. In Malaysia, as in other low- and middle-income countries, husbands or partners are known to influence contraceptive uptake [25,26]. However, this study highlighted that the husband's role often extends to choosing the contraceptive method, rather than simply supporting contraceptive use, differing from other local findings by Wyatt et al. [27] in 2014. Meanwhile, social norms encompass the cus-

tomary behaviors surrounding culture and religion in relation to contraception [14,27]. The perception of “when it happens, it happens,” expressed by participants, reflects a socially accepted reproductive outlook [28], often tied to fatalism and religious or cultural beliefs. Culturally, reproduction is viewed as a natural life process that should not be overly scrutinized; thus, efforts to actively prevent pregnancy may seem unnecessary or even inappropriate [29]. Given the multi-socio-cultural background of the participants, religious influence on contraception was anticipated. Many participants perceived pregnancy, if it occurred, as a divine gift (*rezeki*)—an act of God that should not be planned or prevented [9,10,29]. *Rezeki* is a common term among Muslims, signifying divine provision from God [30]. Therefore, for Muslims, pregnancy—even if unplanned—is viewed as part of divine will and beyond human control. Most Muslim jurists believe that family planning is permissible if practiced within marriage and for health reasons, although some fundamentalist views consider contraception to be contrary to God’s intention for human procreation [9]. Consequently, when unplanned pregnancies occur, women holding such religious beliefs may turn to faith and fate as coping strategies to mitigate anxiety and stress [29].

Implications for practice

This study identified the determinants of contraceptive practices among women with diabetes who did not intend to conceive. These women exhibited several misperceptions regarding contraception. When compounded by a lack of pregnancy planning and religious beliefs, this represents a significant gap in the management of high-risk women. Healthcare professionals should adopt an inclusive approach when engaging women in reproductive planning discussions. Such engagement should be guided by an understanding of individual pregnancy intentions, personal needs, values, and sociocultural considerations. This approach should form the foundation for managing women with chronic diseases in prepregnancy care clinics in Malaysia. HCPs, who serve as critical sources of information, require ongoing training and regular updates to maintain the effectiveness of prepregnancy care clinic services. Furthermore, prepregnancy care clinics should be enhanced as platforms to raise awareness, improve understanding, and address misperceptions about family planning among women with chronic conditions, involving their family members when appropriate.

Strengths and limitations

This study has provided valuable insights into pregnancy planning among women with diabetes. It established that misperceptions about contraception exist, particularly concerning conception among women with diabetes, as well as religious beliefs and sociocultural norms surrounding family planning in Malaysia, all of which influence effective contraceptive practices. The inclu-

sion of participants from various ethnicities allowed for a broader consideration of diverse cultural and religious beliefs in the analysis. Additionally, the inclusion of participants from both urban and rural settings highlighted the impact of differing healthcare resources and societal norms. The dependability of the data was enhanced through triangulation, which involved reflexivity, peer debriefing, and member checking. While the analysis was conducted inductively from the data, it is important to interpret the results in light of several limitations. Notably, views regarding the influence of culture and religion on contraceptive practices were mainly expressed by participants from a single ethnic group, despite prompting across all groups. Whether culture and religion similarly affect other ethnic groups remains unexplored in this study. Furthermore, detailed information on participants’ socioeconomic backgrounds, such as household income and occupation, was not collected; such data might have added further depth to the findings. A future quantitative study may be appropriate to determine associations between socioeconomic status and contraceptive practices. A deeper exploration of participants’ emotions and feelings regarding contraception use was also lacking, particularly among those with poor glucose control who relied on less effective methods. Addressing this gap could have significant implications for enhancing family planning services. The generalizability of the findings is limited, as the study reflects only the views and experiences of women with diabetes attending government primary care clinics. Women attending private clinics or hospital-based settings (either public or private) were not included. These institutions may differ in patients’ sociodemographics, system infrastructure, and resource accessibility, potentially resulting in varied views and experiences regarding contraceptive practices. Future research should explore the perspectives of women from a wider range of institutions to inform the development of pragmatic approaches to improving family planning services nationwide.

Conclusion

This study re-emphasizes the influence of diabetes on women’s decisions to use contraception. However, their decisions are also shaped by other personal factors, including perceived pregnancy susceptibility, lack of knowledge about conception and contraception, and religious beliefs. The societal norm of ‘no pregnancy planning’ further normalizes nonuse of contraception. Husbands often play a significant role as decision-makers in selecting contraceptive methods. HCPs must routinely discuss family planning during diabetes consultations, adopt a more open approach to understanding women’s perspectives on pregnancy planning, and explore their values and concerns to promote the use of effective contraception. Future studies should investigate strategies to improve knowledge dissemination and address misperceptions regarding family planning among women with chronic diseases.

Article Information

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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Data availability

Contact the corresponding author for data availability.

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Conceptualization: all authors. Data curation: IZI. Formal analysis: all authors. Funding acquisition: IZI, NCJ. Methodology: all authors. Resources: IZI. Software: IZI. Supervision: NCJ, LPY, NH. Visualization: all authors. Writing—original draft: IZI. Writing—review & editing: all authors. Final approval of the manuscript: all authors.

Supplementary materials

Supplementary materials can be found via <https://doi.org/10.4082/kjfm.24.0102>. Supplement 1. Topic guide: English and Bahasa Malaysia.

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