

Intention to Use Modern Contraception among Spouses of Women With Diabetes and its Associated Factors

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ABSTRAK

Wanita yang menghidap diabetes berisiko tinggi menyebabkan kehamilan yang buruk jika kawalan glisemik adalah lemah. Menanggukkan kehamilan dengan kontraseptif yang berkesan adalah penting untuk membolehkan diabetes dioptimumkan. Kekurangan galakan dan ketidaksetujuan daripada suami menyebabkan kurangnya penggunaan kontraseptif di kalangan wanita. Justeru itu, kajian ini menilai niat untuk menggunakan kontraseptif moden di kalangan pasangan wanita yang menghidap diabetes dan faktor-faktor yang berkaitan dengannya. Kajian keratan rentas telah dijalankan di dua klinik dari Disember 2022 hingga Mac 2023. Seramai 207 lelaki berumur 18 tahun ke atas, mempunyai isteri menghidap diabetes dan dalam kumpulan umur reproduktif telah mengambil bahagian. Soal selidik dalam talian telah diedarkan, yang terdiri daripada ciri-ciri sosiodemografi, aspek reproduktif, termasuk niat untuk menggunakan kontraseptif moden, pengalaman lalu dalam kontraseptif, komunikasi pasangan, keinginan untuk mempunyai anak, dan memperolehi kaunseling kontraseptif. Pengetahuan terhadap risiko kehamilan berkaitan dengan diabetes dan persepsi penggunaan kontraseptif dalam kalangan wanita juga termasuk dalam soal selidik. Hanya 52.7% lelaki mempunyai niat. Tahap pendidikan (AOR 2.41, 95% CI: 1.17-4.96), pengalaman terdahulu (AOR 3.3, 95% CI: 1.55-6.99), komunikasi pasangan (AOR 2.63, 95% CI: 1.19-5.85), usia isteri (AOR 0.94, 95% CI: 0.89-0.99) dan persepsi

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terhadap kontraseptif (AOR 0.98, 95% CI: 0.96 -0.99) adalah faktor yang signifikan. Usaha harus dilakukan untuk memastikan lelaki mempunyai pengetahuan dan persepsi yang betul terhadap kontraseptif.

Kata kunci: Diabetes; kontraseptif; niat; pasangan; persepsi

ABSTRACT

Women with diabetes are at high risk of adverse pregnancy outcomes if glycemic control is poor. Delaying pregnancy with effective contraception is crucial to allow diabetes to be optimised. Lack of encouragement and disapproval from the husbands leads to poor contraceptive use among women. Therefore, this study assessed the intention to use modern contraception among spouses of women with diabetes and its associated factors. A cross-sectional study was conducted in two clinics from December 2022 to March 2023. A total of 207 men aged 18 years and above, with wives having diabetes, within the reproductive age group were recruited. An online questionnaire was distributed, comprising sociodemographic characteristics, reproductive aspects, including *intention for modern contraception use, past experience of contraception, spousal communication, a desire for children, and received contraceptive counselling*. Knowledge of diabetes-related pregnancy risk and perception of contraception use in women were also included in the questionnaire. Only 52.7% of men had the intention. Educational level (AOR 2.41, 95% CI: 1.17-4.96), previous experience (AOR 3.3, 95% CI: 1.55-6.99), spousal communication (AOR 2.63, 95% CI: 1.19-5.85), wife's age (AOR 0.94, 95% CI: 0.89-0.99) and perception towards contraception (AOR 0.98, 95% CI: 0.96-0.99) were the significant factors. Efforts should be made to ensure men have knowledge and correct perceptions towards contraception.

Keywords: Contraception; diabetes; intention; perception; spouse

INTRODUCTION

Over the world, type 2 diabetes (T2DM) has become one of the most prevalent chronic conditions with high mortality and morbidities (Unnikrishnan et al. 2017). According to our National Health Morbidity Survey, its prevalence is 18.5%, with approximately one in 5 adults is inflicted with this disease (Institute for Public

Health 2015). Local data has shown that nearly 60% of people diagnosed with T2DM diabetes are women, with Malay and Indians mainly affected (National Diabetes Registry 2020; Soo et al. 2021). Across the world, the overall prevalence of diabetes in pregnancy was 15.5%; 12.8% was Gestational Diabetes Mellitus, 1.3% was pre-existing diabetes, and another 1.3% was only detected during

pregnancy (International Diabetes Federation 2019). Most women in the reproductive age group cannot achieve good glycaemic control (Cheong et al. 2013) and are at risk of developing maternal and fetal complications during pregnancy and the perinatal period (Wei et al. 2019). Some of these complications can harm the mother and fetus, such as congenital malformations, stillbirth, polyhydramnios, difficult delivery and pre-eclampsia (Bell et al. 2012; Wei et al. 2019).

Due to its detrimental effect, women should conceive when their blood sugar is well-controlled and utilise family planning to delay the pregnancy until their medical conditions stabilise (Ewa et al. 2018). Unfortunately, although family planning is widely available, many women with diabetes still do not use effective contraception. Studies among the Western population revealed that only 37.6 to 60% of women with diabetes used contraception (Britton et al. 2019; Hunter-Greaves et al. 2020). The situation in Malaysia is also alarming when a local survey among women with chronic illness reported the percentage of non-use contraception is the highest among those with diabetes, at 71% (Manaf et al. 2012). This finding is a significant cause of concern when the risk of unplanned pregnancies is high, exposing unfavourable effects to the mother and fetus.

Past studies have looked into factors causing low contraceptive usage in women and one crucial factor is their spouses' approval (Najafi-Sharjabad et al. 2013; Najimudeen &

Sachchithanathan 2014; Gebeyehu et al. 2020). The husband's role in woman's uptake of contraception is crucial, and the husband's acceptance and positive attitude highly influences the woman's decision (Osuafor et al. 2018; Kwawukume et al. 2022). Past research (Khalila et al. 2017; Gonie et al. 2018), including our local study (Ling & Tong 2017), revealed that husbands' opposition, disapproval and lack of encouragement lead to poor contraceptive usage or family planning utilisation.

Studies among men in the general population found that some factors contributed to men's intention to use modern contraception. Men are likely to have the intention when they have reached the desired family size (Law et al. 2019), have good communication with their spouse, i.e. spousal communication, have experience using contraception (Ling & Tong 2017; Khan et al. 2018) and acquire adequate knowledge and correct perception or attitude towards contraception use in women (Puspita et al. 2018; Kwawukume et al. 2022; Geltore & Lakew 2022). However, some men believe that modern contraception can impose certain risks on women, including infertility, cancer, harmful to women's reproductive organs, reduction of sexual desire and dangerous (Gueye et al. 2015; Kwawukume et al. 2022).

Several local studies have documented that men gain information on contraception through discussions with their spouses (Ling & Tong 2017; Khan et al. 2018). However, in other societies, they obtain knowledge from

attending prepregnancy counselling, in which the benefit of using contraception in delaying pregnancy to allow women to optimise their health will be emphasised (Weisband et al. 2017). Their involvement in preconception care and willingness to use contraception is beneficial, especially when their wives have chronic conditions like diabetes (Ling & Tong 2017). It is also worth noting that a local study reported women with diabetes have insufficient knowledge of diabetes-related pregnancy risk (Osman et al. 2015) and their spouses might also be similar. Understanding the risk of pregnancy in a mother with uncontrolled diabetes is vital for men as they are seen as leaders and main decision-makers for all family matters (Mansor et al. 2015; Endut et al. 2021).

Research has been conducted to evaluate the intention to use contraception among women (Budu et al. 2022; Negash et al. 2023). However, there is limited information on the perspectives of men with wives having diabetes. As men play a pivotal role in contraceptive usage in women, understanding their intention to use modern contraception is important. Measuring the intention is crucial as it has been acknowledged as one of the significant predictors of future contraceptive use (Sarnak et al. 2023).

Therefore, the present study was conducted to assess the intention to use modern contraception among spouses of women with diabetes and its associated factors. Men's intention for contraception use can either be as a user of male contraception or approving their wives in using contraception. In

this study, we specifically looked into factors such as *sociodemographics, knowledge of diabetes-related risk in pregnancy, perception towards contraception use in women, desire for more children, previous experience using contraception, spousal communication* and *whether they had received contraceptive counselling*. Information obtained from this study could assist healthcare providers in improving the husbands' intention to use contraception and, eventually, willingness for contraception use among high-risk mothers, i.e. women with diabetes. Such intervention is needed to ensure that pregnancies for diabetic women are safe and reduce complications for the mother and fetus.

MATERIALS AND METHODS

Study Design, Participants' Criteria and Sample Size Calculation

This cross-sectional study was conducted from December 2022 until March 2023 at two public primary care clinics (Greentown and Gunung Rapat Health Clinic) in Kinta District, Perak, Malaysia. Kinta District is the largest district in Perak state and these two are type 2 clinics, which are the biggest and have the highest number of attendees. The men were identified through their wives, who were among the attendees at the general outpatient clinics. The wives were approached through convenient sampling. The researcher had asked permission from the wives to contact their husbands and once they agreed, the men were

invited to participate in the study. The researcher then screened the men for eligibility criteria. The inclusion criteria were (i) 18 years and above; (ii) had a wife with T2DM and within the reproductive age group (18 to 50 years old) (Manaf et al. 2012). In the present study, we excluded men who had a vasectomy or their wives who had bilateral tubal ligation (permanent contraception method), as they would not require any contraception in future. Once the men agreed to participate, a Google form link which was a self-administered questionnaire was sent. Since, to our knowledge, there is no published study on the intention to use modern contraception specifically among men with wives having diabetes, the prevalence of intention to use modern contraception was calculated based on a previous nationwide survey of 19.3% among men of the general population (Ali et al. 2022). Sample size was calculated with a power of 80% and a confidence interval of 95% ($\alpha = 0.05$) (Charan & Biswas 2013). Hence, 238 participants were needed for this study. Considering 20% dropout, a total of 285 samples were required for this study.

Study Instruments and Variables

This study involved using a self-administered questionnaire in the Malay language, consisting of four sections. (A) Section 1: consisted of the sociodemographic characteristics; (B) Section 2: assessed reproductive aspects, which were (i) intention to use modern contraception (either by the husband or wife) in the future (no

specific time) (ii) the men's or couple's experience in using any contraception (iii) spousal communication (iv) a desire for more children and (v) whether they received contraceptive counselling; (C) Section 3: evaluated the participant's knowledge of diabetes-related risk in pregnancy and (D) Section 4: assessed the men's perception of contraception use in women.

The dependent variables was the intention to use contraception (either by the husband or wife) in future (no specific time). The response to this question was either Yes or No. This means of assessing intention was based on several studies (Budu et al. 2022; Negash et al. 2023). The independent variables were; (i) sociodemographic characteristics (age, ethnicity, religion, education level, employment, monthly income, number of children, and wife's age); (ii) reproductive aspects (the men's or couple's experience using any contraception, spousal communication, a desire for more children and whether they received contraceptive counselling). The options given were either Yes or No; (iii) the men's knowledge of diabetes-related risk in pregnancy, comprising 14 items. The contents of these items covered the fetal and maternal risk of pregnancy in women with diabetes. Items numbered 1-9 were taken from Cartwright et al. (2009), while items 10 to 14 were based on literature reviews and scientific evidence (Bell et al. 2012; Wei et al. 2019). Permission to use them was obtained. The answer to these questions was either true or false. One score was given for a correct answer and none if incorrect.

The total score was then calculated, with a higher score reflecting better knowledge. The maximum score was 14 and the minimum is 0; and (iv) the men's perception of contraception use in women, comprising 13 items. The items were adopted from two studies and permission to use had been obtained. Item number 1-4 was taken from Britton et al. (2020), while item number 5-12 was from Gueye et al. (2015). The last item, item number 13 was added upon suggestions from the panel of experts to suit the local context, assessing whether religious belief influenced their perception towards contraception and this was based on a local qualitative study by Law et al. (2019) and others (Karim 2023; Kwawukume et al. 2022). The response for this questionnaire was a ten-point Likert Scale, ranging from strongly disagree (1 mark) to strongly agree (10 marks). Of note, all 13 items were negative statements regarding contraception use in women. The maximum total score was 130 and the minimum was 13. A high score reflected that the participant agreed with the negative statements, i.e., having negative perception towards contraceptive use in women. Each item's mean score was also calculated and displayed in the results section.

Both questionnaires on men's knowledge and perception were in English and were first reviewed by a panel of experts (a Family Medicine Specialist, an Obstetric And Gynaecology Specialist and A Public Health Medicine Specialist) for content validity. These questionnaires were then translated into the Malay language.

The first step of translation involved forward translation from English to Malay and, subsequently, backward translation from Malay to English. Each step of translation was done by two Malay and English linguistic experts. The translated Malay version of both questionnaires was harmonised and content validation was done through discussion with the panel of experts before proceeding to face validity. There were no discrepancies between the Malay and original English version. Face validity was conducted among ten participants to determine clarity and understanding of the final Malay version. Verbal feedback was obtained from them and there was no problem with the Malay version questionnaire. Subsequently, a pilot study was conducted on 30 participants to determine the reliability of both questionnaires. The Cronbach's alpha for the questionnaire on knowledge of diabetes-related risk in pregnancy and the perception towards contraception use in women were 0.88 and 0.82, respectively.

Data Collection

The participants were given information about the study and if they agreed to participate, a Google form link directing them to an online consent form. After the participants gave consent by clicking "Yes", they would be asked to answer a self-administered questionnaire. They were not required to sign in to an account to answer the questionnaire and their anonymity was ensured. Each of the participants had a unique identification number and this

information was kept confidential.

Statistical Analysis

Data analysis was conducted using SPSS version 27. Descriptive statistics were conducted to describe the categorical data in frequency (n) and percentage (%). The continuous data was described by either mean and standard deviation (SD) or median and interquartile range (IQR) depending on data distribution. Simple logistic regression was performed to identify preliminary factors associated with intention to use modern contraception among spouses of women with diabetes. Variables with p -value <0.25 were selected for further analysis. Multiple logistic regression (backward stepwise method) was conducted to control for potential confounders. Multicollinearity in multiple regression was also checked. The associations of independent variables with the intention to use modern contraception among spouses of women with diabetes were expressed as adjusted odds ratios (AORs) with 95% confidence intervals (CI). Statistical significance was set at $p < 0.05$.

Ethical Approval

This study was approved by the Medical Research and Ethics Committee of the Universiti Kebangsaan Malaysia (FF-2022-063) and the Ministry of Health (NMRR ID-22-00605-ESE (IIR). Permission was also obtained from the state and district level (Perak State Health Department and Kinta District Health Office).

RESULTS

Sociodemographic Characteristics

A total of 335 men were invited through their respective wives, but 19 needed to be excluded as their wives had bilateral tubal ligation. Of 316 men, only 207 completed the questionnaire. Hence, the response rate was 65.5%. Table 1 showed the sociodemographic characteristics of the participants. The mean age of the participants was 44.0 (SD 8.8) years, mostly between 30 and 59. The majority were Malays (90.3%), employed (85.5%), and 64.3% attained a secondary level of education. The median monthly household income was RM 2500.00 (IQR 1800-3800). Most of them had 1 to 4 children (78.2%). The mean age for the participants' wives was 41.1 (SD 6.4) years.

Intention to Use Modern Contraception and Reproductive Aspects

Only 109 (52.7%) spouses of women with diabetes had the intention to use modern contraception. More than half of them (55.1%) had experienced using contraception with their wives. Many discussed with their wives about contraception, i.e. spousal communication (67.1%) and had no desire for more children (70.5%). Nearly half (49.3%) received contraceptive counselling.

Men's Knowledge of Diabetes-Related Risk in Pregnancy

TABLE 1: Sociodemographic characteristics of participants (n=207)

Variables		n (%)	Mean (SD)	Median (IQR)
Age (years)	18-29	10 (4.8)	44.0 (8.8)	-
	30-44	100 (48.3)		
	45-59	88 (42.5)		
	60	009 (4.3)		
Ethnicity	Malay	187 (90.3)	-	-
	Chinese	6 (2.9)		
	Indian/Others	14 (6.8)		
Religion	Islam	189 (91.3)	-	-
	Buddhist	4 (1.9)		
	Hindu	11 (5.3)		
	Christian	2 (1.0)		
	Sikh	1 (0.5)		
Education ¹	Primary	5 (2.4)	-	-
	Secondary	133 (64.3)		
	Tertiary	69 (33.3)		
Employment	Not working	30 (14.5)	-	-
	Working	177 (85.5)		
Household income ² (RM)	<2500	88 (42.5)	-	2500 (1800-3800)
	2500-4999	90 (43.5)		
	≥5000	29 (14.0)		
Number of children	0	26 (12.6)	-	-
	1-4	162 (78.2)		
	5	19 (9.2)		
Wife's Age (years)	18-29	12 (5.8)	41.1 (6.4)	-
	30-45	134 (64.7)		
	46-52	61 (29.5)		

¹Primary education: standard 1 till standard 6, Secondary education: form 1 till form 5, Tertiary education: Diploma/degree/master/PhD

²<2500: category B40 (B1); 2500-5000: category B40 (B2-B4); >5000 : category M40 based on Department of Statistic Malaysia 2019

The mean total score for men’s knowledge of diabetes-related risk in pregnancy was 11.2 (SD 3.35), indicating that the participants had good knowledge. Table 2 showed the percentage of correct responses for all items in this questionnaire. Most participants knew that diabetes could cause macrosomia and increase the risk of complications during antenatal, intrapartum and postpartum (89%). Only half knew diabetes could cause hypoglycemia in a newborn (51%).

Men’s Perception towards Contraception Use in Women

Out of the total score of 130, the participants’ mean total score for perception towards contraception was 50.6 (SD 20.7). Since the items portrayed negative statements, a high score indicated that the participants believed these statements, i.e., having negative perception towards contraception. Table 3 demonstrated the mean score for each item. The minimum score for each item was 1

TABLE 2: Percentage of correct responses for items in the knowledge of diabetes-related risk in pregnancy questionnaire among spouses of women with diabetes

No.	Items	%
1	Pregnant women with diabetes will have a risk of worsening eye function in the mother	75.4
2	Pregnant women with diabetes will have a risk of worsening kidney function in the mother	70.0
3	Pregnant women with diabetes will have a risk of birth trauma	88.0
4	Pregnant women with diabetes will have a risk of Caesarean section	85.5
5	Pregnant women with diabetes will have a risk of miscarriage	78.7
6	Pregnant women with diabetes will have a risk of birth defect	76.3
7	Pregnant women with diabetes will have a risk of having a big baby	89.9
8	Pregnant women with diabetes will have a risk of stillbirth	73.9
9	Pregnant women with diabetes will have a risk of having a baby with hypoglycemia	51.2
10	Pregnant women with diabetes will have a risk of having a premature baby	84.5
11	Pregnant women with diabetes will have a high-risk pregnancy	75.8
12	Pregnant women with diabetes will have an increased risk of complications during pregnancy, delivery and after birth	89.4
13	Pregnant women with diabetes will have an increased risk of having a baby born with complication	84.5
14	Pregnancy can worsen women’s health with diabetes	85.0

TABLE 3: The score for items on perception towards contraception use in women

No.	Items	Mean score	SD	Min score	Max score
1	Birth control is less safe for women with diabetes	4.4	2.8	1	10
2	Birth control is less effective for women with diabetes	4.0	2.5	1	10
3	Women with diabetes need birth control less than other women	3.8	2.6	1	10
4	Diabetes makes it harder for women to get pregnant	5.0	2.6	1	10
5	Use of contraceptive injection make women infertile	4.3	2.4	1	10
6	People who use contraception end up with health problems	4.2	2.4	1	10
7	Contraceptives can harm the womb	3.8	2.3	1	10
8	Contraceptives reduce women’s sexual desire	4.2	2.5	1	10
9	Contraceptives can give you deformed babies	3.4	2.2	1	10
10	Contraception is dangerous to women’s health	3.7	2.3	1	10
11	Contraceptives can cause cancer	3.8	2.3	1	10
12	Family planning is a women’s business and a man should not have to worry about it	3.2	2.6	1	10
13	My religion/belief does not allow the use contraception	2.7	2.1	1	10
	Overall score	50.6	20.7	13	130

* All thirteen items were negative statements regarding contraception use in women. The maximum total score was 130 and the minimum is 13. A high score reflected that the participant agreed with the negative statements, i.e., having negative perception

(strongly disagree) and the maximum was 10 (strongly agree). The item with the highest mean score was item 4, 'diabetes makes it harder for women to get pregnant', followed by item 1: 'birth control is less safe for women with diabetes' and item 5: 'use of contraceptive injection makes women infertile'. The lowest mean score was item 13: stating, 'my religion/belief does not allow me to use contraception'.

Factors Association with Intention to Use Modern Contraception among Spouses of Women with Diabetes

Table 4 showed the preliminary associated factors whereby age, ethnicity, religion, educational level, employment, household income, wife's age, negative perception towards contraception use in women, previous

TABLE 4: Preliminary factors associated with intention to use modern contraception among spouses of women with diabetes

Variables		Crude OR (95% CI)	Wald statistic (df)	p-value
Age (years)		0.95 (0.92, 0.98)	8.54 (1)	0.003*
Ethnicity ¹	Non-Malay	1		
	Malay	2.86 (1.05, 7.77)	4.26 (1)	0.039*
Religion	Non-Muslim	1		
	Muslim	3.18 (1.09, 9.28)	4.49	0.034*
Educational level ²	Lower	1		
	Higher	2.62 (1.42, 4.8)	9.65 (1)	0.002*
Employment	None	1	2.21 (1)	0.137*
	Yes	1.82 (0.82, 4.0)		
Household income (RM)		1.00 (1.00, 1.00)	2.9 (1)	0.089
Number of children	0-4	1		
	≥5	1.416 (0.56, 3.56)	0.55 (1)	0.4600
Wife's age (years)		0.94 (0.89, 0.98)	7.71 (1)	0.005*
Past experience using contraception	No	1		
	Yes	6.26 (3.41, 11.48)	35.2 (1)	<0.001*
Spousal communication	No	1		
	Yes	5.87 (3.06, 11.27)	28.34 (1)	<0.001*
Desire for children	Yes	1		
	No	1.11 (0.61, 2.02)	0.12 (1)	0.732
Received contraceptive counselling	No	1		
	Yes	1.91 (1.1, 3.33)	5.28	0.022*
Knowledge of diabetes-related risk in pregnancy		1.035 (0.95, 1.12)	1.69 (1)	0.406
Negative perception towards contraception use in women		0.97 (0.96, 0.99)	13.36 (1)	<0.001*

*p < 0.25 were included in the multiple logistic regression; ¹Chinese, Indian and other ethnicities were categorised into non-Malay; ²Diploma/Degree/Master/PhD were categorised into higher educational level; *Household income was in continuous data

TABLE 5: Factors associated with intention to use modern contraception among spouses of women with diabetes

Variables		Adjusted OR (95% CI)	Wald statistic (df)	p-value
Educational level	Lower	1		
	Higher	2.41 (1.17, 4.96)	5.71 (1)	0.017
Past experience using contraception	No	1		
	Yes	3.3 (1.55, 6.99)	9.68 (1)	0.002
Spousal communication	No	1		
	Yes	2.63 (1.19, 5.85)	5.66 (1)	0.017
Wife's age		0.94 (0.89, 0.99)	5.68 (1)	0.017
Negative perception towards contraception use in women		0.98 (0.96, 0.99)	5.79 (1)	0.016

Backward-stepwise multiple logistic regression

The model fit statistics: 1.The Hoshmer and Lemeshow test p-value= 0.49 indicating there was no significant difference between observed and predicted. Nagelkerke R^2 = 0.38

No interaction between variables. Low multicollinearity. Variance inflation factor (VIF) < 10

Conclusion: The model fitted well. Model assumptions were met. There were no interaction and multicollinearity problems

experience of using contraception, spousal communication and received contraceptive counselling were the significant factors.

Table 5 displayed the final associated factors. Based on the analysis, five factors were found to be significant: *higher educational level, increased wife's age, previous experience using contraception, spousal communication and negative perception towards contraception use in women*. Men with a higher education level, had previous experience using contraception, and spousal communication was two to three times more likely to have the intention to use modern contraception. Meanwhile, those with an increase in wife's age and negative perception were less likely to have the intention to use modern contraception. The analysis yielded a Nagelkerke R^2 of 0.38, indicating that these five factors could only explain 38% of the variance.

DISCUSSION

To the best of our knowledge, this study is among the first to investigate the intention to use modern contraception, specifically among spouses of women with diabetes and the factors influencing it. Assessing men's intentions is very important as it indicates their acceptance or willingness and appears to be a strong predictor for future use of contraception (Sarnak et al. 2023). In this study, only half of the men intended to use modern contraception despite knowing their wives had diabetes. This figure concerned us as men should be more receptive and willing to delay pregnancy by utilising effective contraception if their wives' condition was not permissible. They should be aware that when the blood sugar is uncontrolled, it imposes a significant risk to the mother and baby. Currently,

we cannot compare this figure with any similar studies among men with wives having diabetes. However, compared to studies among men in the general population, our figure was somewhat close to a local study (Khan et al. 2018) and higher than some Asian societies (Ali et al. 2017; Soe et al. 2019). On the contrary, some surveys reported even higher proportion of men accepting contraception use (Mahato et al. 2020; Msovela et al. 2020; Geltore & Lakew 2022).

Based on the current study, the significant factors contributing to the intention for modern contraception use were *higher educational level, past experience using contraception, spousal communication, increased in wife's age and negative perception towards contraception use in women*. Our study revealed that men with a higher education level were more likely to accept contraceptive use in women, affirming results from previous research (Kwawukume et al. 2022; Geltore & Lakew 2022). This suggested that highly educated men tend to be more exposed to various sources of health information, enabling them to understand the pregnancy risk in women with diabetes. Hence, they are more willing to utilise modern contraception for the benefit of their wives. It is also acknowledged that education reflects on health literacy skills; i.e. when people are highly educated, they can evaluate health information and are better at making decisions on health (Paakkari et al. 2019). The current study also demonstrated that past contraceptive experience and spousal

communication played a significant role. Men who had been involved in contraception use were more likely to accept it again, which was similarly reported by other studies (Khan et al. 2018). This indicates that having experience could enhance men's confidence and they are convinced of the beneficial effects of family planning. Apart from that, communicating with wives helps them to decide on family planning and, perhaps, for the benefit of marital relationships, as explained by Khan et al. (2018).

The present study failed to show any significant association between the intention to use contraception and knowledge of diabetes-related risk in pregnancy despite the high mean total score. A possible explanation is that men hesitate to accept contraception and are probably concerned about its side effects (Kwawukume et al. 2022; Geltore & Lakew 2022). Most of our participants knew that pregnant women with diabetes are at risk of having multiple complications, including macrosomia, but not many knew about the risk of hypoglycaemia, birth defects, stillbirth and worsening maternal's kidney function. There is a lack of similar research investigating knowledge of these aspects among men, but studies among women with diabetes revealed their knowledge is poor (Osman et al. 2015; Mukhali et al. 2023). Moreover, past studies have indicated that knowledge is not a significant factor contributing towards the actual use of contraception among women (Akoku et al. 2022; Alameer et al. 2022). There seems to be a gap between knowledge and contraceptive

use, indicating that other factors may play a role.

Apart from knowledge, we also examined whether men's perception of contraception use in women contributes to their intention. There was a significant association between perception and intention to use contraception. This result seemed to be consistent with other studies, whereby men's perception or attitude towards contraception influences their involvement in family planning (Amraeni & Kamsu 2021; Geltore & Lakew 2022). Looking into this study, the mean score for perception towards contraception was 50.6 from the total mark of 130, suggesting that participants had some negative views about contraception. Of note, the higher the score, the more negative the perception was. Some participants thought contraception could cause women to become infertile and difficult to conceive. This might be why they hesitated to allow their wives to use modern contraception. Moreover, the study participants perceived that contraception could reduce women's sexual desire and even the women themselves admitted to this (Hoorsan et al. 2021). It was also found that men in our study felt that contraception was unsafe for women with diabetes and this issue is worth further exploration as there had been concern about cardiovascular risk when these women utilised the hormonal type of contraception (Sitruk-Ware & Nath 2013). More evidence is needed to address all these issues to give assurance to women and their partners.

Nevertheless, Karim (2023) opined that the poor or negative perception towards contraception is due to a lack of knowledge, leading men to disagree on its use. It has been suggested that accessibility to more information on contraception is crucial for better acceptance among men (Ling & Tong 2017; Karim 2023). Following this issue, we had found that only 49% of our participants received contraception counselling, which warranted further investigation. Our finding seemed to align with some studies among women with diabetes, in which the percentage of them receiving contraceptive counselling during preconception was only between 26% and 46% (Osman et al. 2015; Hibbert et al. 2018). Contrary to Kwawukume et al. (2022), our results portrayed the participants generally do not think religion disapproved in using contraception. This was reflected in the low mean score of the item on religious belief in the perception questionnaire. Nonetheless, it was difficult to conclude, as the Malay ethnicity and one religion were over-represented in the current study.

Apart from the above factors, the wife's age influenced men's intention and the mean age of the participants' wives was 41 years. Manaf et al. (2012) reported that women aged 41 to 50 are less likely to use contraception, probably thinking their possibility of conceiving is low, which also seems to be a factor for men. Moreover, most of our participants claimed they had completed family and already had one to four children.

This study had several limitations. First, the current study was cross-

sectional design, whereby this design cannot provide cause and effect relationships between the factors and outcomes of interest. Second, the result cannot be generalised to all settings as most participants were Malay and the sampling method was convenient sampling. Another limitation was using only the Malay version of the self-administered questionnaire. Hence, the response from men who were unable to read Malay could not be captured. Nevertheless, the findings of this study can provide an initial insight into the intention to use modern contraception among spouses of women with diabetes and its associated factors. We suggested to conduct a nationwide survey using a multilingual version of questionnaires for future study.

CONCLUSION

The proportion of men with wives having diabetes intending to use modern contraception was not high. Significant factors were having a higher education level, previous experience of contraception use, spousal communication, increased in wife's age and negative perception towards contraception use in women. Our findings highlighted that men should receive proper education on the pregnancy risk in women with diabetes and the benefits of contraception. Healthcare providers should make a great effort to resolve missed perceptions and doubts, along with emphasising that contraception is a mean to allow women to reach optimum blood sugar control before pregnancy. Community intervention

programmes should focus on encouraging husbands to participate in preconception care and contraceptive counselling, as their acceptance of contraception use is vital to ensure the safety of future mothers and babies.

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CONFLICT OF INTEREST

The authors declared no conflict of interest.

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