

KNOWLEDGE, PERCEPTION & CONTRACEPTION USE
AND
FACTORS ASSOCIATED WITH CONTRACEPTION
NON-USE AMONG WOMEN WITH DIABETES

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DISSERTATION SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF MEDICINE
(FAMILY MEDICINE)



UNIVERSITI SAINS MALAYSIA
2017

ACKNOWLEDGEMENTS

Alhamdulillah, thank you Allah for all the blessings and the strength He granted me.

In completing this study, I wish to express my appreciation for everyone who assisted me along the way. First I would like to thank my parents, Hj Ngah bin Ismail and Hjh Asmah binti Ali, and mother-in-law, Sebariah binti Abd Majid. All of them have provided endless support since the beginning of the Master's program, and I extend my gratitude for their faith in me and my endeavours. To my beloved husband, Muhammad Hasyim Wafi bin Ismail; thank you for believing me and for your generosity in allowing me to pay full attention in completing this task. My appreciation is beyond words.

I would like to thank my supervisors, Dr Razlina binti Abd Rahman, Dr Norwati binti Daud and Dr Imran bin Ahmad, for encouraging my plan and providing unwavering support and contributions throughout the entire process. The project only came about with their guidance and expertise, and their optimism allowed for a quick and smooth conclusion.

I also would like to thank my friends in the Master in Family Medicine program who were there for keeping my energy recharged; with all your supports and encouragement to complete this mission.

Finally, I wish to thank all of women with diabetes who showed their support and were willing to share their experiences by participating in this research

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ABBREVIATION

BTL	Bilateral tubal ligation
CDC	Center for Disease Control, US.
COCP	Combined oral contraception pills
IUCD	Intrauterine contraceptive device
MEC	Medical eligibility criteria
PPC	Pre-pregnancy care
T1DM	Type 1 Diabetis Mellitus
T2DM	Type 2 Diabetis Mellitus.
US	United States
WHO	World Health Organization

ABSTRACT

English version

KNOWLEDGE, PERCEPTION AND CONTRACEPTION USE AND FACTORS ASSOCIATED WITH CONTRACEPTION NON-USE AMONG DIABETIC WOMEN

Introduction: Globally, the prevalence of diabetes is currently increasing in trend. In Malaysia, similar trend is reported by The National Health and Morbidity Survey (NHMS) 2015. The survey has reported that the prevalence of diabetes is high in young adults. Thus, more women from younger age group with diabetes in Malaysia will be facing a great reproductive risk. We are interested to evaluate the contraception use, the knowledge on contraception and the perception towards contraception practice among diabetes women with unmet need for contraception.

Objectives: To study the knowledge, perception and practice of contraception and factors associated with contraception non-use among diabetic women in reproductive age attending outpatient clinic, in a tertiary hospital.

Methodology: This is a cross sectional study involving 324 patients aged 18 years old to 50 years old with Type 1 or Type 2 Diabetes Mellitus. Simple random sampling with replacement method was applied to select participants who attended outpatient clinic and Diabetes Centre of a tertiary hospital from March 2015 to May 2015. Self-administered questionnaires were used to obtain the socio demographic characteristics and clinical data. Another part of questionnaires was used to assess practice of contraception, knowledge and

perception towards contraception practice. The data were analysed for descriptive statistic and multiple logistic regression.

Result: The median age of respondents was 45. Majority (72.2%) of diabetic women were contraception non-users. In all, 11.4% of diabetic women have good knowledge regarding contraception effectiveness and safety, pre-pregnancy care and pregnancy risk with regards to diabetes. A sizeable 54.6% of respondents showed satisfactory perception towards contraception practice. There was no significant association ($p = 0.168$) between knowledge and perception towards contraception. Factor significantly associated with contraception non-use were being Malay (OR=2.63, 95% CI 0.18, 0.83, $p=0.015$), being older-age (OR=6.32, 95% CI 4.23, 10.68, $p<0.01$), and being diabetic women with successful pregnancy history (OR=0.12, 95% CI 0.06, 0.38, $p<0.01$).

Conclusion: There is high prevalence of contraception non-use among diabetic women in reproductive age. Majority of respondents have poor knowledge on contraception. Despite having poor knowledge, majority of respondents have satisfactory perception towards contraception. Contraception non-use was more likely associated with being Malay ethnic and older-age. Meanwhile, being diabetic woman with previous successful pregnancy is protective from being contraception non-user.

Malay version

**PENGETAHUAN, PERSEPSI DAN AMALAN PERANCANG KELUARGA
SERTA FAKTOR-FAKTOR BERKAITAN TIDAK MENGAMALKAN
PERANCANG KELUARGA DI KALANGAN WANITA PENGHIDAP
DIABETES**

Pengenalan: Di peringkat global, terdapat peningkatan bagi prevalen penyakit diabetes. Di Malaysia, peningkatan yang sama turut dilaporkan oleh Kajian Kesihatan dan Morbiditi Kebangsaan pada tahun 2015. Kajian ini melaporkan prevalen diabetes adalah tinggi dikalangan golongan belia. Oleh itu, akan terdapat lebih ramai pesakit diabetes wanita yang akan meghadapi risiko reproduktif yang tinggi. Pengkaji ingin menilai pengetahuan tentang perancang keluarga, penggunaan perancang keluarga, dan persepsi terhadap amalan perancang keluarga di kalangan wanita penghidap diabetes yang mempunyai keperluan kepada perancangan keluarga

Objektif: Untuk mengkaji tahap pengetahuan, persepsi dan amalan berkaitan perancang keluarga dan faktor-faktor yang berkaitan dengan tidak menggunakan perancang keluarga di kalangan wanita penghidap diabetes dalam usia reproduktif yang menghadiri klinik pesakit luar di sebuah hospital tertuari.

Metodologi: Kajian rentas ini melibatkan seramai 324 orang pesakit berumur antara 18 tahun hingga 50 tahun yang menghidapi penyakit diabetes mellitus Jenis 1 atau Jenis 2. Pemilihan sampel secara rawak mudah dengan gantian telah dilakukan untuk memilih peserta yang datang ke klinik pesakit luar dan

juga Pusat Diabetes di hospital tertiar dari Mac 2015 hingga Mei 2015. Borang soal selidik yang perlu diisi sendiri telah digunakan untuk mendapatkan ciri-ciri sosio demografi, ciri-ciri klinikal, kaedah perancang keluarga yang diamalkan, pengetahuan serta persepsi dari para responden. Data yang diperolehi telah dianalisa menggunakan statistik deskriptif dan regresi logistik berganda.

Keputusan: Umur median responden kajian adalah 45 tahun. Majoriti (72.2%) wanita yang menghidap diabetes tidak menggunakan kaedah perancang keluarga yang berkesan. Sebanyak 11.4 % di kalangan wanita penghidap diabetes mempunyai tahap pengetahuan yang baik berkaitan perancang keluarga, prekehamilan dan risiko kehamilan berkaitan dengan diabetes manakala 54.6% daripada responden juga menunjukkan persepsi yang memuaskan terhadap perancang keluarga. Kajian juga mendapati tidak terdapat perkaitan ($p = 0.168$) di antara tahap pengetahuan dengan persepsi terhadap perancang keluarga. Faktor-faktor signifikan berkaitan tidak menggunakan perancang keluarga adalah berbangsa Melayu (OR=2.63, 95% CI 0.18, 0.83, $p=0.015$), berusia lebih (OR=6.32, 95% CI 4.23, 10.68, $p<0.01$) dan wanita peghidap diabetes yang mempunyai sejarah kehamilan yang berjaya (OR=0.12, 95% CI 0.06, 0.38, $p<0.01$).

Kesimpulan: Prevalen tidak menggunakan perancang keluarga adalah tinggi dalam kalangan wanita yang masih subur dan menghidap diabetes. Majoriti daripada responden mempunyai tahap pengetahuan yang rendah berkenaan perancang keluarga. Walaupun demikian, majoriti responden mempunyai persepsi yang memuaskan terhadap amalan perancang keluarga. Amalan tidak menggunakan perancang keluarga adalah dikaitkan dengan wanita diabetes

berbangsa Melayu dan mempunyai umur yang lebih tua. Manakala, mempunyai sejarah kehamilan yang berjaya adalah faktor pelindung daripada tidak menggunakan perancang keluarga.

CHAPTER 1

INTRODUCTION

Epidemiology of Diabetes

Diabetes is characterised with abnormal carbohydrate metabolism and in long term, leading to the development of micro and macro vascular complications. The prevalence of diabetes is rapidly increasing worldwide. Globally, diabetes currently affecting 415 million adults and the number is projected to rise to 642 million by the year 2040 (1). In Malaysia, The National Health and Morbidity survey (NHMS) 2015 has reported that the prevalence of diabetes was 17.5% for adult above 18 years old. Of concern, more than half of diabetes patient aged 18 years old and above were unaware of their diagnosis. As a result, highest number of undiagnosed diabetes were in the young (2). Thus, there is increasing number of younger women with diabetes that would be facing greater reproductive risk as compared to healthy women.

Diabetes and Pregnancy

Pregnancy is physiologically associated with increase insulin resistance and reduced sensitivity to insulin as an effect of placental hormones. Undoubtedly, pre-existing diabetes in pregnancy poses a risk to maternal long-term morbidity and fetal outcome (3-5)

Maternal complications of per-existing diabetes can be severe and life-threatening. It was estimated that 3.4% of maternal mortality in the United Kingdom had pre-existing diabetics (6) and similar trends were observed in

Malaysia (7). The maternal diabetes complications may be categorised as those related to glycaemic control such as hypoglycaemia and diabetic ketoacidosis (DKA); those related to microvascular complications namely the gastropathy, retinopathy and nephropathy and those related to macrovascular complications of which the most relevant is coronary heart disease.

Fetal complications of maternal diabetes include congenital malformation, uteroplacental insufficiency, fetal death, macrosomia, birth injury, poor fetal lung maturity and postnatal hypoglycaemia. Direct obstetric complications of diabetes includes spontaneous miscarriage, pre-eclampsia, polyhydramnios and obstructed labour secondary to macrosomia (8). All the complications were due to the poor maternal glycemic control during the critical period of embryogenesis as well as throughout pregnancy.

Due to the association with high risk pregnancy, it is utmost important for diabetic women to have a well-planned pregnancy.

Preconception Care for Women with Diabetes

Preconception care is as a set of intervention that aims to identify and modify biomedical, behavioural and social risk to the women's health or pregnancy outcome through prevention and management (9), aimed to promote health at preconception and to improve the pregnancy-related outcome (10). For women with diabetes, decision whether she wants to conceive or not and the timing of her desired pregnancy is not simply a question of choice. This is because a well-planned or unplanned pregnancy may have a big difference in

the outcome and have lifelong implications for her health and most importantly for the health of her future child.

To ensure successful maternal and fetal outcome, adequate childbirth spacing and well-planned pregnancy is advocated in this group of women (11). Their medications should be adjusted and euglycaemia should be achieved prior to the conception. During this optimization of health status, the unplanned pregnancy should be avoided by effective, yet safe contraceptive methods.

Preconception care can reduce maternal risk for miscarriages, risk of developing serious medical emergency like ketoacidosis, accelerated retinopathy and nephropathy and lastly the risk of delivering anomalous infants. Meta-analysis showed that preconception care among diabetes women had been shown to markedly reduce the rate of congenital malformations (12) and perinatal deaths, fewer maternal hospitalization as well as less use of neonatal intensive care.

Contraception Care

Family planning is the mainstay method in ensuring safe motherhood. Contraception care means the offering of effective methods of contraception and knowledge about its indications, contraindications and implications of its use.

Women with diabetes can be offered several contraceptive options, which when properly selected, and closely monitored, do not accelerate their disease process or affect their medical therapy. The contraception choice should address their lifestyle preferences as well as their state of health and

possible pregnancy plan. Most importantly, each diabetic woman needs to be educated and be an active participant in her pregnancy planning which allow her to choose either to avoid conceiving or to time her pregnancy to meet personal and health reasons. This can only happen when woman with diabetes is provided with an effective contraceptive method (13).

As the diabetes progress, end-organ complications will occurs leading to microvascular and macrovascular disease. Diabetes vascular sequelae will also affects contraception choices of these women. Thus, whenever a woman with diabetes mellitus desires contraception, the service providers must be prepared to deal with this group's specific characteristics. These women are recommended to use methods of contraception which are highly efficacious and safely suited to their clinical condition, as certain methods of contraception may be contraindicated for this illness and/or the medications for diabetes.

For assessment and suitability of contraception, the World Health Organization (WHO) had published the 5th edition of the Medical Eligibility Criteria (MEC) for Contraceptive Use (14). This important guideline provides recommendation regarding safety of various contraception methods for women with relation to their medical conditions. In general, the conditions are classified into 4 for each type of contraception; as in Table 1.

As for diabetes patient, the WHO has classified diabetes with insulin-dependent, diabetes with comorbidities (nephropathy, retinopathy, neuropathy or other vascular disease) or long standing diabetes or more than 20 years as

conditions associated with high risk for adverse health events resulting from unintended pregnancy (14).

Table 1: Categories of eligibility for a given contraception method

Categories	The safety of using given contraceptive method in the setting of a given medical condition
1	A condition for which there is no restriction for use of a given contraceptive methods.
2	A condition for which the advantages of using a given method generally outweigh the theoretical or proven risks.
3	A condition for which the theoretical or proven risks of using the given contraceptive method outweigh the advantages
4	A condition that represents an unacceptable health risk for use of a given contraceptive method.

Note: Reproduce from the 5th edition of the Medical Eligibility Criteria (MEC) for Contraceptive Use, World Health Organization (14).

Contraception prevalence and practice in Malaysia

Family planning is an official policy in Malaysia since 1966. The services are provided by three main agencies. The Ministry of Health via Division of Family Health Development is the major provider, followed by the National Population and Family Development Board (NPFDB) and the Federation of Reproductive Health Association (FRHAM). The family planning services are also widely available at various private health facilities.

The indicator used in measuring family planning is contraceptive prevalence rate (CPR). The denominator used is the total number of women in reproductive age. In Malaysia, the CPR showed increasing trend from 1966 to 1994, before it plateau at 50% (15). From 2005 until 2010, the CPR was much lower at 32.3% (16). But in 2014, it improved to 52.2% (17). Compared to our neighbouring country, between 2005-2010, Malaysia achieved the lowest (16).

The contraceptive prevalence rate in Malaysia for modern contraception is 34.3% and 17.9% for other methods (17). Modern contraception in this survey includes hormonal contraception pills, hormonal injection, implants, intrauterine device, condom and others (emergency contraception pills, hormonal vaginal rings and vasectomy) (17). In general, the use of effective contraception methods is low. This is unacceptable especially among women with uncontrolled diabetes (18). On the contrary, women with diabetes should be practicing effective contraception in view of the risks that they carried for being diabetics.

The CPR is inversely related to the unmet demand of contraception which is defined by WHO as the gap between not wanting a child, but that at time, was not practicing contraception (19). The last national survey that looked at this unmet demand was the 2004 survey by NPFDB. In that survey the unmet demand was around 25% (20). There had been later population survey done but, the 2014 did not look at the unmet demand. The low CPR and high unmet need for contraception in general population also can be implied to our diabetes women, resulting in unplanned pregnancies in this high risk group of women.

JUSTIFICATION OF RESEARCH

Malaysian data showed increasing diabetes prevalence especially among those in the reproductive age group (2). However, there were limited data available on the aspect of contraception use or non-use among diabetic woman. Due to the high risk status in association with pregnancy, diabetic women in reproductive age should be identified and adequately managed. Recognising this metabolic problem and the existing gap in its management among women with diabetes particularly concerning their unmet need for contraception, this research was conducted.

This study aimed to assess the contraceptive practice among diabetic women who are still in their reproductive age group, their knowledge on effective and safety of contraception, knowledge on aspect of pre-pregnancy and pregnancy risk and their perceptions towards contraception.

The information gathered in this study will be useful to understand and to manage the factors related to low contraception uptake in this high risk group in Malaysia. The outcome of this research may aid the healthcare provider to plan more appropriate intervention suitable to local diabetes population; particularly to the group with unmet need for contraception. The important endpoint is reduction in Malaysian maternal and fetal morbidity and mortality, by risk reduction in this high risk population.

CHAPTER 2

LITERATURE REVIEW

2.1 Prevalence of contraception usage

Data from other countries showed that the prevalence of contraception use among diabetes women were high, ranging from 53.8% from study by Mekonnen et al (21), 58.8% from study by Nojomi et al (22), 77.1% from Kjaer et al (23), 89.3% from Napoli et al (24). On the contrary a local study by Manaf et al in 2012, on contraception used among women with chronic disease showed prevalence of contraception use among diabetes women were low (28.8%) compared to women with other chronic disease. She postulated that the low contraception usage among women with diabetes was because they perceived that they had low fertility while others had misperception of contraception contraindication. She also argued that the healthcare provider payed minimal attention in the family planning management among these women (25).

2.2 Practice of contraception among diabetic women

A study by Kjaer et al among diabetic women with insulin dependent in Denmark showed that the preferred contraception methods were female sterilization (23.3%), IUCD (21.7%) and condoms (20.1%)(23). The findings were comparable to Vahratian et al in her study in United State whereby 61.2% were contraception user with more (36.7%) diabetic women preferred BTL (26). In addition, Shawe et al studied the use of hormonal contraceptive methods by diabetes women in United Kingdom. She found diabetes women were significantly less likely to use hormonal contraception compared to women

without diabetes (type 1 diabetes (RR 0.83 95%CI 0.69-0.93), type 2 diabetes (RR 0.60 95%CI 0.42-0.83)(18). Meanwhile, Manaf et al have found that women with chronic illness in Malaysia frequently used COCP (13%), condoms (7.08%) and IUCD (5%) as their preferred method (25). Nojomi et al in his study among Iranian women with hypertension, diabetes or obesity found that 100% of his respondents practiced some form of contraception. They however included ineffective contraception methods. In their study, the commonest contraception methods used was withdrawal (41.2%), male/female sterilization (33.8%) and condom (15%) (22).

2.3 Knowledge on effectiveness and safety of contraception methods

The study on knowledge on contraception among diabetic women in Malaysia is scarce. It was found that general knowledge on contraception among Malaysian women, was relatively low, ranging between 27.9% to 54.5% (27, 28). In both studies, the knowledge items that were assessed include birth spacing, contraception methods and usage as well as on natural contraception method (calendar method and cervical mucus method).

Diabetic women should have knowledge of both effective and safety of contraceptive methods and choose methods that suited to their diabetes background. The WHO defines effective contraception as modern contraceptive methods (i.e. Contraceptive pills, injections, intrauterine device, implants or perfect use of condoms) all of which have high efficacy and low failure rates (19, 29). Meanwhile, withdrawal, safe period and herbal medicine were not considered as effective contraceptive methods as defined by the WHO

guideline on contraceptive use (30). Safety of contraception methods is defined as methods that must not induce any diabetic-related risk such as thromboembolic and cardiovascular complications. Women with diabetes without complications can choose from the full range of contraceptive methods in view of the advantage of contraception use outweigh the risk. Diabetic women with complications however need medical advice to assess the risk-benefit equation (30).

The WHO also has developed the medical eligibility criteria to guide contraception choice (14). Prescription criteria; either initiation or continuation of the treatment has been established according to various literature with updated information every four years. This important document uses 4 categories to establish the indication or contraindications for different contraception methods. Methods in category 1 can be used without restriction. Category 2 indicates the method can be used but careful follow-up may be required. Category 3 requires careful clinical judgement and generally should be avoided unless other more appropriate methods are unavailable or unacceptable. Category 4 indicates the methods are contraindicated in affected women. Table 2 shows different categories assigned to diabetic women for commonly available contraception methods in Malaysia.

A qualitative study by Chuang et al indicated that diabetic woman had showed no or minimal knowledge about contraceptive safety with regards to the chronic medical conditions (31). Evangelista et al also reported almost similar findings in their study on the use of contraception methods with regards to diabetes following the MEC which was introduced by the WHO. In their study,

70.8% of diabetic women had no knowledge regarding the use of contraception according to WHO MEC (32). Unfortunately, we found no published studies on knowledge of effective and safety of contraception particularly among diabetic women in Malaysia.

Table 2: Eligibility for commonly available contraception for patient with history of gestational diabetes, diabetes patient and in those with multiple risk factors for arterial cardiovascular disease.

Conditions	WHO MEC Category					
	COC	POP	DMPA/ NET- EN	CU- IUCD	LNG- IUCD	LNG/ ETG
a) History of gestational diabetes.	1	1	1	1	1	1
b) Non vascular disease						
i. Non-insulin dependent.	2	2	2	1	2	2
ii. Insulin dependent.	2	2	2	1	2	2
c) Nephropathy/Retinopathy /Neuropathy.	3/4	2	3	1	2	2
d) Other vascular disease or diabetes of >20 years' duration.	3/4	2	3	1	2	2
e) Multiple risk factors for arterial cardiovascular disease (such as older age, smoking, diabetes, hypertension and dyslipidemia).	3/4	2	3	1	2	2

¹ Methods can be used without restriction.

² Method can be used but careful follow-up may be required.

³ Methods requires careful clinical judgement and generally should be avoided unless other more appropriate methods are unavailable or unacceptable.

⁴ Methods are contraindicated in affected women.

Note: Adapted from the 5th edition of the Medical Eligibility Criteria (MEC) for Contraceptive Use, World Health Organization (WHO) (14).

2.4 Knowledge on pre-pregnancy care

Concerning the pre-pregnancy care among women with diabetes, study by Moura et al reported that 70.7% respondents showed moderate to extensive knowledge concerning proper pre-pregnancy (33). Pre-pregnancy care items assessed by the authors in that study includes maintaining control of capillary glucose level (up to 110mg/dl for fasting glucose test and up to 140mg/dl for random tests), healthy diet (low salt, low fat and low sugar), healthy weight (Body Mass Index (BMI) between 18.5 and 24.9), and maintaining control of blood pressure (up to 140/90mmHg). An audit on pre-pregnancy by Cartwright et al among diabetic women in United Kingdom showed that knowledge on benefits of optimised diabetes control during pre-conception and throughout pregnancy was very low. However, the respondents showed good knowledge on pre-pregnancy planning which includes diabetes optimization, folic acid supplementation and to have baseline kidney function test and funduscopy examination (34). The American Diabetes Association (ADA) and Malaysian Perinatal Manual have provide guideline on pre-conception issues that needed to be covered among women with diabetes (35, 36).This includes tight glycaemic control, reproductive education to adolescent with diabetes, folic acid supplementation, screening for complications and medication optimization.

The concept of pre-pregnancy care had only been introduced in Malaysia in the recent years. Study looking at pre-pregnancy care found that among those screened, more than half had at least one risk factor (37). A recent study among pregnant women in North East Malaysia found that 51.9% of their respondent have good knowledge on pre-pregnancy care (38) while another older study among Indian women found that 61.1% of their population had good

pre-pregnancy knowledge (39). However, their population was all pregnant women attending antenatal clinic. Specific study looking at the knowledge on pre-pregnancy care among diabetic and thus high risk women were lacking.

2.5 Knowledge on risks of pregnancy

Regarding risk of pregnancy among diabetes women, study by Moura et al reported 39.6% respondents have none knowledge of pregnancy risk while 54.7% reported limited knowledge on pregnancy risk (33). While exploring knowledge and attitudes related to pregnancy and preconception health in women with chronic medical conditions, Chuang et al found diabetic women were generally aware of the increased risk to developed pregnancy-related complications and this knowledge also affected their pregnancy intention (31). Osman et al who did study on reproductive knowledge, found that 90.4% diabetic women had knowledge of diabetes complications. However, 67% had no knowledge on how pregnancy affects their diabetes. In addition, they also did not find any association between knowledge and contraception practice (40). Meanwhile, Charron-Prochownik et al in their research on adolescent diabetic patient, found that teenagers with diabetes had high score for both diabetes-related and in general family planning items (41).

2.6 Diabetic women perception on contraception practice.

Perception is the process of interpreting and organizing sensation to produce meaningful experience. Meanwhile, psychologists defined attitude as mental or neural state of readiness, organized through experience, exerting a directive or dynamic influence on the individual response to all object or situations to which it related. A simpler definition of attitude is the person's

actual feeling or way of thinking about something or someone based on their perceptions. There is an intrinsic link between perception and attitude whereby a person first perceives. Then, followed by learning from perception (on account of stimuli depending on their need) and then, form an attitude, which will dictate their action. Both perception and attitude have cultural, religious, traditional and ethnic biases for many people (42).

We found three important aspects that influenced the perceptions on contraception practice for women in general. These aspects include social or environment, the information or knowledge received and service provider. Spousal approval, for example, has been associated with a higher probability of contraceptive use among women, even when other factors known to predict contraceptive practice to be controlled like what has been found by Wang RH and Chiou CJ (43). In Muslim country such as Turkey, Cindoglu et al in their paper mentioned that husbands' opposition has been reported as the main factor for not using contraception (44). In Asian countries like Malaysia, men are still dominant and are the major decision maker in the family affair including the reproductive health matters. Their dominance is further reinforced by religion, culture and economic power. For these reasons, we believed that approval from the spouse has an important role in the perceptions towards contraception usage.

Only one quantitative research found focusing on the perception towards contraception among women with chronic illnesses including diabetes. Manaf et al found contraception non-user achieved lower perception score as compared to contraception user. However, the mean score difference between

contraception user and non-user was 1.21 point (95% CI 1.52, 3.70) and it was considered too small to be clinically significant. Thus, perception items were excluded in multiple variable analyses. However, they did not provide detailed results on perception items assessed and its scoring (25). Other studies were mostly on patients attitudes on contraception. In view of the link between perception and attitudes and the scarcity of information on perceptions towards contraception practice, we decided that the nearest studies to quote were studies from Ismail et al and Shafei et al. Both studies used the same tools to assess general positive attitudes towards family planning, modern contraception and husbands support. The cut off score of more than 85% were taken as satisfactory attitude on family planning. Ismail et al in earlier study noted that among Malay women with short birth spacing, 69% had unsatisfactory attitude towards contraception (45). Whereas, Shafei et al found 77.9% of healthy, suburban women had unsatisfactory attitude toward family planning (28). However, we think that the tool maybe not specific to be applied to women with diabetes.

In another study, it was found that diabetic women perceived lack of control over ability to avoid pregnancy. Most women said that unintended pregnancy was planned by God or fated. The researcher implied that this perception of lack of control was a possible barrier to contraceptive use and compliance (31).

2.7 Association between knowledge and perception

Exhaustive search on knowledge and its association with perception toward contraception among diabetic adult women through multiple databases found only one study which was closely related. This study by Shafei et al looked at the knowledge and attitude on family planning among healthy, non-diabetic married couples and they described that there was no association between knowledge and attitude towards contraception (28). However, with the advancement in diabetes care particularly with the introduction of pre-pregnancy care in our national health surveillance, we postulated that there would be improvement in the knowledge of diabetic women and that improvement in knowledge on effectiveness and safety of the methods used, pre-pregnancy care and pregnancy risk among women with diabetes should have influenced their perceptions towards contraception. We expected that those with good knowledge score will have better perception. However, we concur that there are various other factors for example cultural, religious, traditional and ethnic biases that will also influence the perception. (46).

2.8 Factors associated with contraception non-use among diabetic women.

Few studies were found in the literature to investigate contraception behaviour of diabetic women from the perspective of non-use or the lack of contraceptive practice. Local study by Manaf et al, found four factors associated with contraception non-use among women with chronic medical conditions. In their study, women who did not have any children were 4.6 times more likely not to use contraception as compared to women who have children (95%CI: 1.66,

12.57). Those who attended health clinics were more likely to be non-user (OR=1.7 95%CI 1.09, 2.79). Contraception non-user was 2.3 times more common among older women, as compared to younger age group women. (95%CI: 1.19, 4.48). The last association was those who did not finished secondary school were 3 times more common not to use contraception as compared to those who finished secondary school (95%CI: 1.43.5.77) (25).

Vahratian et al in their study on contraception non-use among US women with diabetes and overweight and obese noted that being older age (OR=2.61 95%CI 1.61, 4.22), being non-Hispanic black race (OR=1.76 95%CI 1.34, 2.30), using medically assisted conception (OR=3.32 95%CI 2.35, 4.70) and having desire for pregnancy (OR=2.27 95%CI 1.79, 2.88) were associated with contraception non-use (26).

Other study by Wu et al among healthy US women at risk for unplanned pregnancy also found similar themes associated with contraception non-use which include being in the older age group (OR=6.3 95%CI 2.7, 14.7), being non-Hispanic black (OR=1.8 95%CI 1.2, 2.8), received high school education or less (OR=2.4 95%CI 1.4, 4.0), being Medicaid recipients (OR=1.9 95%CI 1.2, 2.9) or uninsured (OR=1.6 95%CI 1.1, 2.4) and had few (1-4) months of sexual activities (OR=3.8 95%CI 2.7, 5.3) (47).

Frost et al studied factors associated with contraceptive use and non-use in the US found that the likelihood of women to become contraception non-user were being older age group (OR=3.25 P<0.01), and had less than college education (OR=3.81 P<0.01), while women with 2 sexual partners were less

likely to be non-user (OR=0.34 P<0.01). The study also found certain attitudes variables that were significantly associated with contraception non-use. These includes not important to avoid pregnancy and pleased to becoming pregnant. Their study also noted that those who do not have specific contraception provider and the inability to contact provider for query on contraception were associated with the contraception non-use (48).

Shah et al in the study of contraceptive non-use among Kuwaiti women showed that negative attitudes towards contraception were associated with contraception non-use (49). These negative attitude includes respondents herself disapproves contraception use and whose husbands disapproves of contraception use.

Interestingly, a study by Pazol et al looking at age-stratified model showed that there is a specific age-group characteristic for contraception non-use. Adolescent women tend not to use contraception because of dissatisfaction with the contraception side effect or experiencing other difficulties associated with the contraception usage and if they have public health insurance. Meanwhile, young adult and older women, will be more likely not using contraception if they have public health insurance coverage, being single, had intention to have children in the future and if they have difficulty to conceive (50).

Meanwhile, Brunie A has conducted a study in Rwanda to clarify reasons for non-use of contraception. In her research, factors associated with likelihood of contraception non-use includes being older age group (OR=1.10, P< 0.01),

being less than 6 months postpartum (OR=5.14 P<0.01), wanting a child within 1 year (OR=8.81 P<0.01) and acknowledging barriers to contraception (OR=3.34 P<0.01) (51).

It would be prudent to postulate that knowledge has a major influence on the use of contraception. However, Osman et al in their study of women with diabetes found knowledge of complications of diabetes did not have any impact on the participant's current practice of contraception (Pearson $\chi^2(1)=0.4187$, Fisher's exact $p=0.527$) (40). Meanwhile Evangelista et al who studied knowledge of diabetes women on contraceptive methods appropriate for diabetes found that 70.8% of their respondents had no knowledge regarding appropriate use of contraception tailored to their diabetes status (32). Another study by Moura et al noted that 44.5% of diabetic women demonstrated adequate knowledge regarding pre-pregnancy care while 54.7% showed limited knowledge on maternal and fetal risk. In both studies, majority (98.1%) used some form of contraception (male condom (44.2%), combined oral contraceptive pill (34.6%)). However, both did not analyse the association between knowledge and contraception use (32, 33).

CONCEPTUAL FRAMEWORK

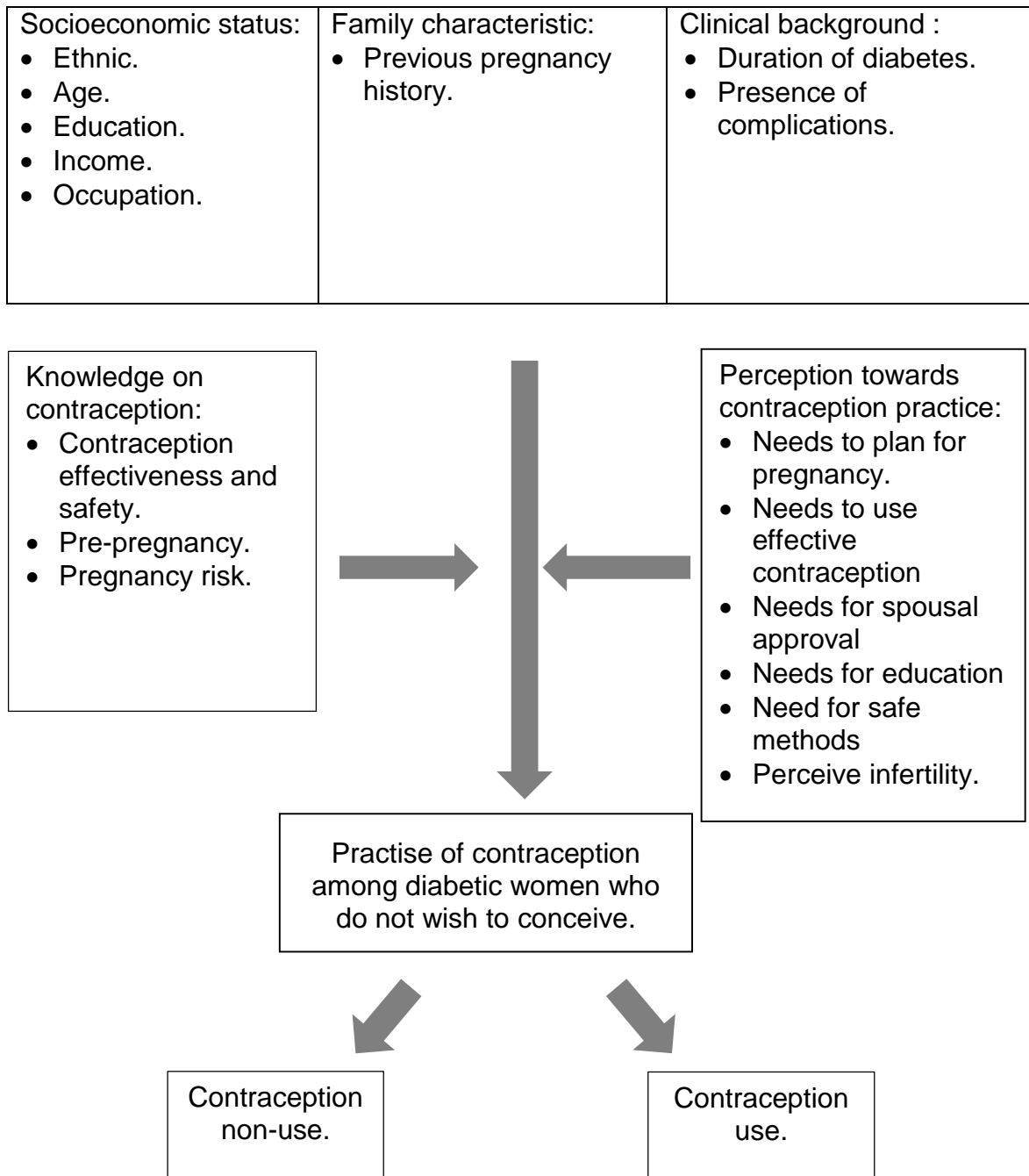


Figure 1: Conceptual framework of the study of knowledge, perception and contraception use and factors associated with contraception non-use among women with diabetes

CHAPTER 3

OBJECTIVES

3.1 General Objective

To assess the contraceptive use, knowledge (effective and safety of contraception, pre-pregnancy care and pregnancy risk) and perception towards contraception practice and factors associated with contraception non-use among diabetic women in reproductive age attending outpatient clinic, Tertiary hospital.

3.2 Specific Objective

1. To determine the proportion of contraception use.
2. To determine the proportion of good knowledge on contraception with regards to its effectiveness, safety, pre-pregnancy care and pregnancy risk.
3. To determine the proportion of satisfactory perceptions towards contraception practice.
4. To determine association between knowledge on contraception and perception toward contraception
5. To identify the factors associated with contraception non-use.

among diabetic women in reproductive age attending outpatient clinic of a tertiary hospital.

3.3 Research Hypothesis

1. There is an association between level of knowledge and perception towards contraception practice among women with diabetes who attend outpatient clinic in a tertiary hospital
2. There are association between sociodemographic (age, ethnicity, education level, income, occupation), family characteristic, clinical diabetes background (diabetes duration, diabetes complications), knowledge of contraception, perception towards contraception practice and contraception non-use among diabetic women in reproductive age group attending outpatient clinic.

CHAPTER 4

METHODOLOGY

4.1 Study Design

This is a cross sectional study.

4.2 Study area

This study was conducted in two outpatient clinics at a tertiary hospital. The hospital is a centre for referral for the whole state. The Primary Care Clinic is run by 50 staffs including the Family Medicine specialist, the Family Medicine Specialist in training, medical officers and nurses. Daily attendance in this clinic ranges from 200 to 300 patients. This clinic is an integrated clinic and diabetes mellitus is one of the major chronic illnesses suffered by the many patients who visit this clinic. The other outpatient clinic is Diabetes Centre, which is run by the Endocrinologist, the internal physician in training and the nurses. Weekly attendances of the endocrine patients are estimated to be around 50 patients per week.

4.3 Population and Sampling

4.3.1 Reference Population

Reference population was all women with Type 1 and Type 2 Diabetes Mellitus in tertiary hospital.