MODERN CONTRACEPTION USAGE AND BODY WEIGHT CHANGE AMONG WOMEN IN KOTA BHARU, 2013-2014

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MODERN CONTRACEPTION USAGE AND BODY WEIGHT CHANGE AMONG WOMEN IN KOTA BHARU, 2013-2014

by

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BMI	Body Mass Index
CI	Confidence Interval
CPR	Contraceptive Prevalence Rate
FFPAM	Federation of Family Planning Association Malaysia
FRHAM	Federation of Reproductive Health Associations
IUCD	Intrauterine Contraceptive Device
LNG-IUD	Levonorgestrel intrauterine device
MDG	Millennium Development Goals
MOH	Ministry of Health
NPFDB	National Population and Family Development Board
ROC	Receiver Operating Characteristics
SD	Standard Deviation
STI	Sexually transmitted infections
UNFPA	United Nations Population Fund
WHO	World Health Organization

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ABSTRAK

TAJUK: PENGGUNAAN KONTRASEPTIF MODEN DAN PERUBAHAN BERAT BADAN DALAM KALANGAN WANITA DI KOTA BHARU, 2013-2014

Latar belakang kajian: Kontraseptif tidak diamalkan secara meluas di Malaysia. Antara sebab-sebab keengganan dan penamatan penggunaan kontraseptif adalah disebabkan oleh kesan sampingan yang dialami sebagai contoh pertambahan berat badan terutamanya dalam kalangan pengguna kaedah hormon.

Objektif: Kajian ini bertujuan untuk menentukan jenis-jenis kaedah kontraseptif moden yang digunakan, faktor-faktor yang berkaitan dengan penggunaan kaedah hormon dan untuk membandingkan perubahan berat badan di antara pengguna kaedah hormon dan bukan hormon dalam kalangan wanita yang menggunakan perkhidmatan perancang keluarga di klinik-klinik kesihatan di Kota Bharu pada tahun 2013-2014.

Kaedah: Kajian ini adalah satu kajian kohort retrospektif. Tiga-ratus-lapan-puluh wanita yang menggunakan kaedah kontraseptif yang sama selama 12 bulan di klinik-klinik kesihatan di Kota Bharu telah dimasukkan ke dalam kajian ini. Data diperoleh daripada Kad Perancang Keluarga (PKW 1(a)/06) yang didapati di semua klinik kesihatan. Regresi logistik berganda digunakan bagi menentukan faktor-faktor yang berkaitan dengan penggunaan kontraseptif yang mengandungi hormon dan ANCOVA bagi membandingkan perubahan berat badan di antara pengguna kaedah hormon dan bukan hormon.

Hasil kajian: Kaedah hormon merupakan kaedah paling lazim digunakan (89.5%); pil perancang kombinasi (44.2%), pil progestogen-sahaja (13.7%) dan suntikan (31.6%)

berbanding kaedah bukan hormon (10.5%) [kondom (6.6%) dan alat dalam rahim (3.9%)]. Selepas menyelaras untuk pembolehubah yang lain, umur wanita dan pengalaman kesan sampingan merupakan faktor penting di mana dengan peningkatan usia wanita, kebarangkalian menggunakan kaedah hormon berkurangan (OR 0.92, 95% CI 0.87, 0.97, *p*-value 0.005) dan dengan pengalaman kesan sampingan, kebarangkalian wanita menggunakan kaedah hormon juga berkurang (OR 0.14, 95% CI 0.06, 0.33, *p*-value <0.001). Purata perubahan berat badan di kalangan pengguna kaedah hormon (Adjusted mean 2.85, 95% CI 2.45, 3.24) mempunyai perbezaan ketara berbanding pengguna kaedah bukan hormon (Adjusted mean 0.46, 95% CI -0.73, 1.65; *p*-value <0.001) selepas menyelaras untuk umur, pendapatan isi rumah, bilangan kandungan dan BMI asas.

Kesimpulan: Majoriti wanita menggunakan kaedah hormon. Faktor-faktor penting yang berkaitan adalah umur wanita dan pengalaman kesan sampingan. Perubahan berat badan dalam kalangan wanita yang menggunakan kaedah hormon adalah ketara lebih tinggi berbanding kaedah bukan hormon. Kaunseling perlu melibatkan penerangan tentang pertambahan berat badan sebagai kesan sampingan yang berkemungkinan kepada pengguna kaedah hormon dan tumpuan yang lebih perlu diberikan kepada wanita pada usia yang lebih muda dan pengguna kali pertama.

Kata kunci; Kontraseptif moden, perubahan berat badan, wanita pada usia reproduktif, faktor hubungkait, kesan

ABSTRACT

MODERN CONTRACEPTION USAGE AND BODY WEIGHT CHANGE AMONG WOMEN IN KOTA BHARU, 2013-2014

Background of the study: Contraception is not widely practised in Malaysia. Among the reasons for reluctance and discontinuation of contraceptive use include experience with adverse effects for example weight gain especially for hormonal users.

Objectives: This study aimed to determine the types of modern contraceptive methods usage, the associated factors for hormonal contraceptive use and to compare the body weight change between hormonal user and non-hormonal user among women seeking family planning services in Kota Bharu health clinics in 2013-2014.

Methodology: This study was a retrospective cohort study. Three-hundred-eighty women who used the same contraceptive method for 12 months in Kota Bharu health clinics were included in this study. Data were obtained from the Kad Perancang Keluarga (PKW 1 (a)/06) that were available in all the health clinics. Multiple logistic regression was used to determine the factors associated with hormonal contraceptive use and ANCOVA was used to compare the mean body weight change between hormonal and non-hormonal users.

Results: The commonest methods used were hormonal methods (89.5%); combined contraceptive pills (44.2%), progestogen-only pills (13.7%) and injections (31.6%) as compared to non-hormonal methods (10.5%) [condoms (6.6%) and intrauterine device (3.9%)]. After adjusting for other variables, age of women and experience

with adverse effect were the significant factors whereby with increment in age of women, the odds of using a hormonal method decreased (OR 0.92, 95% CI 0.87, 0.97, *p*-value 0.005) and with experience of adverse effect, the odds of women using hormonal methods decreased (OR 0.14, 95% CI 0.06, 0.33, *p*-value <0.001). The mean weight change among hormonal users (Adjusted mean 2.85, 95% CI 2.45, 3.24) were significantly higher from non-hormonal users (Adjusted mean 0.46, 95% CI -0.73, 1.65; *p*-value <0.001) after controlling for age, household income, number of pregnancies and baseline BMI.

Conclusion: Majority of the women used hormonal contraceptive methods. The significant associated factors were age of women and experience with adverse effect. Mean weight changes among women using hormonal methods were significantly higher than those using non-hormonal contraceptive methods. Counselling should include the explanation regarding weight gain as a possible adverse effect for hormonal users, and more focus on younger women and first time users.

Keywords: Modern contraception, weight changes, women of reproductive age, associated factors, outcome

CHAPTER ONE

INTRODUCTION

1.1. Family planning dilemma in Malaysia

Malaysia is a developing country with most of its citizens is within the reproductive age group (65.5%) and in a union or married (60.7%) (Lembaga Penduduk dan Pembangunan Keluarga Negara, 2016). Fifty-one percent of the women contribute to the working group in Malaysia (Lembaga Penduduk dan Pembangunan Keluarga Negara, 2016). There had been little variation in the death of women related to pregnancy and childbirth in Malaysia and this is of utmost significance if Malaysia were to achieve its vision in becoming a developed nation (World Health Organization, 2015a). Malaysia did not achieve the Millennium Development Goals (MDG) 5 target of reducing by three-quarters, between 1990-2015, the maternal mortality ratio which was 11 per 100,000 live births since the mortality ratio for Malaysia was 23.2 per 100,000 live births (World Health Organization, 2015a). As family planning was proven to significantly avert maternal deaths, it became one of the core elements in the Safe Motherhood Initiative, a campaign conducted globally in 1987 to reduce maternal mortality (Ahmed *et al.*, 2012).

Family planning takes place when a couple plans or prevents pregnancies to achieve their desired number of children and the spacing in between pregnancies by using

any contraceptive method (Derzko, 1986). Contraceptive methods can be classified into modern and traditional methods (WHO/CCP, 2011).

According to Ahmed *et al.* (2012), who conducted an analysis on maternal deaths averted by the use of contraception in 172 countries, it was found that the maternal mortality ratio was lower in countries with higher contraceptive prevalence rate. An example was in developed regions with contraceptive prevalence rate of 75%, the maternal mortality ratio was only 10 in 100 000 live births in 2008 as compared to Sub-Saharan Africa with maternal mortality rate of 596 in 100 000 live births in 2008 with contraceptive prevalence rate of only 22.1% (Ahmed *et al.*, 2012).

In addition to reducing maternal mortality, family planning also incurs other benefits which include reducing perinatal mortalities, reducing the number of unplanned pregnancies and abortions, promotes national financial security and reducing the strain on natural resources and environment (UNFPA, 2016).

Despite the numerous aforementioned benefits, the contraceptive prevalence rate in Malaysia, which measures the percentage of married women or in-union women between 15 years old and 49 years old who are currently using any contraceptive method, had remained stagnant for the past 30 years. The data from 1984 until 2014 showed that only about 50% of women were practising any contraceptive methods (modern and traditional) (Figure 1.1) (National Population and Family Development Board, 1974,1984,1994,2004; Lembaga Penduduk dan Pembangunan Keluarga

Negara, 2016). Out of this percentage, only 34% of them were using modern contraceptive methods (National Population and Family Development Board, 1974,1984,1994,2004; Lembaga Penduduk dan Pembangunan Keluarga Negara, 2016). The trend in maternal mortality ratio in Malaysia showed little variation as shown in Figure 1.2. Therefore it can be deduced that the plateau in the trend of maternal mortality ratio in Malaysia is partly attributed by the similar trend observed in the contraceptive prevalence rate.

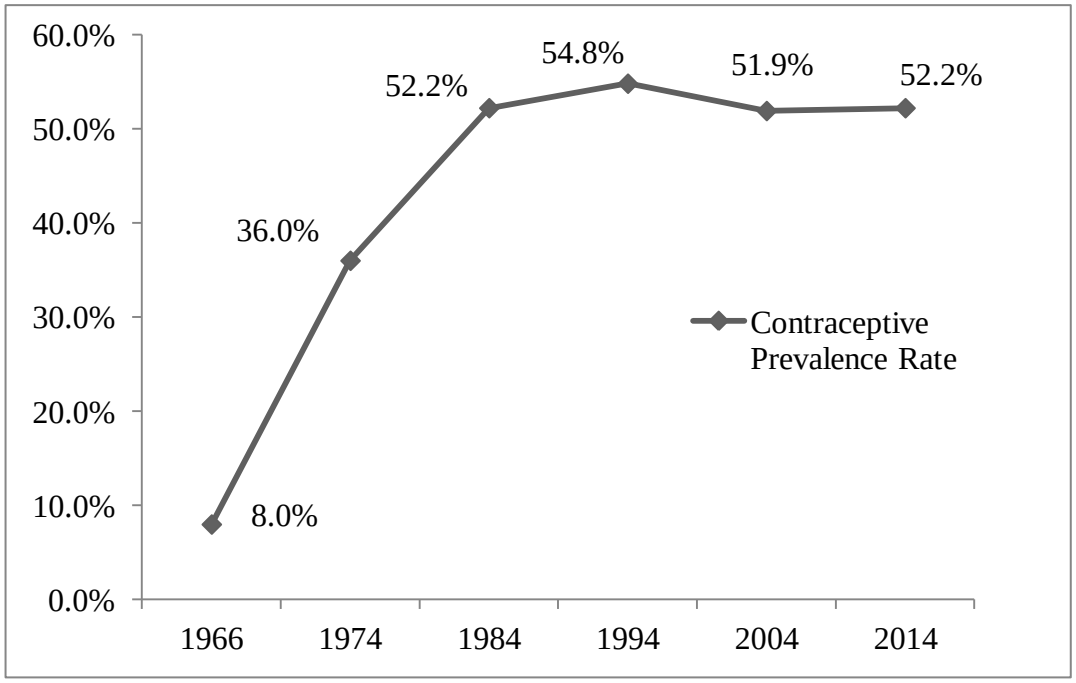

Figure 1.1: Contraceptive prevalence rate (CPR) in Malaysia (1966-2014)

Ref: National Population and Family Development Board (1974,1984,1994,2004); Lembaga Penduduk dan Pembangunan Keluarga Negara (2016)

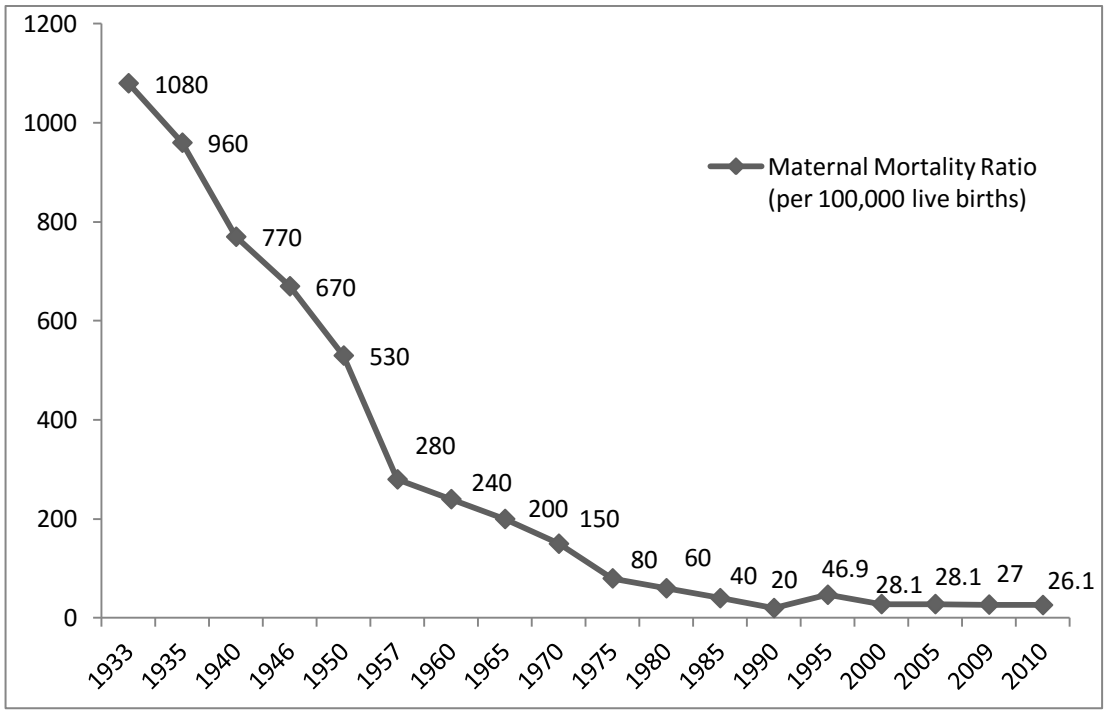

Figure 1.2: Maternal mortality ratio in Malaysia (1993-2010)

Ref: Department of Statistics Malaysia (2014)

1.2. Family planning services in Malaysia

Even before the introduction of the Safe Motherhood Initiative in 1987, Malaysia had realized the importance of family planning in tackling maternal mortality and hence, made family planning an official policy by launching the National Family Planning Program in 1966 (Ahmad *et al.*, 2010). The maternal mortality ratio declined tremendously following this from over 1,000 deaths per 100,000 live births in the 1930's to about 100 deaths per 100,000 live births in 1970's (Hanson, 2010).

Family planning is being made accessible and affordable to all women and her partner in Malaysia through the family planning policy and provision of services through various agencies. They include the National Population and Family Development Board (NPFDB), Federation of Reproductive Health Associations (FRHAM) [(formerly known as Federation of Family Planning Association Malaysia (FFPAM)], Ministry of Health (MOH), private hospitals and clinics, pharmacies and traditional healers such as *sinseh* (Ahmad *et al.*, 2010).

The family planning services provided in the government facilities under the Ministry of Health include government hospitals and health clinics. In order to ensure that the family planning services are available and accessible to all, the rural clinics which are positioned close to the community and handled by the community nurses also offer these services. The family planning services in the health clinics are managed by medical officers with a team consisting of staff nurses and community nurses. Each health clinic and rural clinic has their own record-keeping system whereby the list of those seeking family planning services are recorded in the family

planning registration book. Each client also has their details recorded in the individual family planning cards (Kad Perancang Keluarga PKW 1(A)/06). Each month, a written report is delivered to the respective district health office for monitoring purposes. Verbal consent is obtained from women who wished to receive contraceptive methods that are non-invasive such as contraceptive pills. Meanwhile, a written consent is obtained from women who wished to use intrauterine devices (Kementerian Kesihatan Malaysia, 2014).

1.3. Reluctance in using contraceptive methods

Apart from the noticeable plateau in the contraceptive prevalence rate, there was a substantial discrepancy according to ethnicity and state (Ahmad *et al.*, 2010). The Malays had always been the group with a low contraceptive prevalence rate for those practising modern methods (28.2%) and Kelantan, the state with Malay as the predominant ethnic group, had the lowest contraceptive prevalence rate in Malaysia with only 17.5% of women practising modern methods (National Population and Family Development Board, 1974,1984,1994,2004).

Malay generally wished to have more children as opposed to other races, the males are more dominant in Malay and they have a tendency to use herbal remedies or traditional methods (Ahmad *et al.*, 2010; Najafi *et al.*, 2011; Najimudeen and Sachchithanantham, 2014). These aforementioned factors contributed to the low percentage of contraceptive use among Malays.

Among the reasons stated for not using any contraceptive methods or discontinuing a contraceptive use were due to their wish to have more children, husband's objection and side effects (National Population and Family Development Board, 1974,1984,1994,2004; Norbanee *et al.*, 2008; Centers for Disease Control and Prevention, 2010). Other studies found that availability and access, difficulty of use and cost also posed a barrier to contraceptive continuation (Raine *et al.*, 2011; Hameed *et al.*, 2015). Thus, contraceptive method discontinuation is not solely reliant on the client's factors, but is being contributed by provision of services as well. A study conducted by Rakhshani and Mohammadi (2004) found that contraceptive continuation differs between different contraceptive methods with the lowest contraceptive continuation were among depot medroxyprogesterone acetate users and the highest continuation rate were among levonorgestrel implant users.

Weight gain was among the side effects experienced that led to discontinuation of contraceptive use (Norbanee *et al.*, 2008; Najafi *et al.*, 2011). Among the contraceptive methods available, hormonal methods particularly the depot medroxyprogesterone led to weight gain as observed in previous studies (Clark *et al.*, 2005; Berenson and Rahman, 2009). The issue of weight gain due to contraceptive use is a critical issue since Malaysia has the highest prevalence of adults with body mass index (BMI) of more than 25 kg/m^2 (World Health Organization, 2011).

1.4. Rationale of the study

Majority of the contraceptive users are hormonal contraceptive users (Ahmad *et al.*, 2010). There are various contraceptive methods available and these include the non-

hormonal methods such as barrier methods, for example the male condoms which confer protection against sexually transmitted infections, and the copper intrauterine contraceptive devices which are highly effective and long-acting in nature. Every woman should have access to all the contraceptive methods available so that she can make an informed choice after considering the advantages and disadvantages of each method. This study provides the information on the common contraceptive methods used in the local setting and the factors associated with its use.

As weight gain is a common adverse effect experienced by women using hormonal contraceptive method and is one of the most common causes for women to discontinue contraceptive use in the advent of obesity problem, the findings in this study may shed some light regarding the magnitude of the problem. Based on previous studies, there were inconsistent findings that associate weight changes with hormonal contraceptive method use. Thus, our study may provide evidence of association for our local setting, whether hormonal contraception is associated with significant weight gain. This finding may facilitate the health care providers in delivering health education and suggesting the suitable contraceptive method for the woman. Quality contraceptive service can be provided to women to enhance compliance and continuation through counselling which include explanation regarding the possible adverse effects experienced by women in the local setting and the extent of the adverse effect experienced in terms of weight gain.

In addition, guidance can be given to the provider of family planning services as this study provides information on the factors that influence women's contraceptive

method use. Furthermore, methods that are known to be highly effective and not dependent on typical use by women with less effect on weight gain may be offered to them. Finally, this information may help to improve the contraceptive prevalence rate and continuation or compliance of the contraceptive method, thus improving the women's overall health.

1.5. Research questions

1. What are the types of modern contraceptive methods usage among women seeking family planning services in government health clinics in Kota Bharu in 2013-2014?
2. What are the factors associated with hormonal contraceptive methods usage among women seeking family planning services in government health clinics in Kota Bharu in 2013-2014?
3. Is there any significance difference in mean body weight change between women using hormonal and non-hormonal contraceptive methods in government health clinics in Kota Bharu in 2013-2014?

1.6. Research hypotheses

1. There are associations between socio-demographic characteristics, reproductive factors, husband's characteristics, medical illness and body mass index with hormonal contraceptive methods usage among women seeking family planning services in government health clinics in Kota Bharu in 2013-2014.

2. There is significant difference in mean body weight change between women using hormonal and non-hormonal contraceptive methods.

1.7. Objectives

a. General Objective

To determine the types of modern contraceptive methods, their associated factors and body weight change among women seeking family planning services in government health clinics in Kota Bharu in 2013-2014.

b. Specific Objectives

1. To determine the types of modern contraceptive methods usage among women seeking family planning services in government health clinics in Kota Bharu in 2013-2014
2. To determine the factors associated with hormonal contraceptive methods usage among women seeking family planning services in government health clinics in Kota Bharu in 2013-2014
3. To compare the body weight change between women using hormonal and non-hormonal contraceptive methods in government health clinics in Kota Bharu in 2013-2014

CHAPTER TWO

LITERATURE REVIEW

2.1. Choice of contraceptive methods

In accordance with the Millennium Development Goals which calls for universal access to reproductive health, reproductive and sexual health is declared as a human right and therefore, each woman and her partner has the right to decide and gain information and means of family planning (World Health Organization, 2015b). Family planning refers to regulating the timing and number of pregnancies and their spacing by usage of contraceptive methods which may either be modern or non-modern (commonly referred to as traditional methods) (Singh *et al.*, 2014; Hubacher and Trussell, 2015; UNFPA, 2016). Each and every couple has the right to obtain information needed before deciding on the number of children they desire to have, the timing and spacing between one child birth to the next through counselling given by providers of the family planning services (Mahmood and Naz, 2012; UNFPA, 2016).

Based on a study by De Irala *et al.* (2011) who conducted a survey in five European countries assessing the factors that women would take into account before considering the use of a contraceptive method, it was found that women would consider the use of oral contraceptive pills and intrauterine device after obtaining advice from doctors, but for barrier use, opinion from the partner was highly significant. Hence, in addition to counselling the women and her partner, the health

care providers need to have adequate training and knowledge to provide the services. They also need to be able to manage the adverse effects experienced as well as providing women and her partner with alternatives to ensure quality family planning service (Mahmood and Naz, 2012).

Contraceptive method mix refers to the distribution of women using different types of contraceptive method (UNFPA, 2016). The contraceptive method mix is integral in deciding local family planning policy and program, as well as in assessing effectiveness and outcome in family planning program (UNFPA, 2016). With presence of various methods, women have a choice to select a method that is best suited to her and her partner to achieve their family planning goals (UNFPA, 2016).

2.2. Modern contraceptive methods

Hubacher and Trussell (2015) defined modern contraceptive methods as medical procedures or products that interfere with reproduction due to sexual intercourse. Modern contraceptive methods are either permanent such as female and male sterilization (bilateral tubal ligation and vasectomy) or reversible. The reversible methods can further be divided into hormonal or non-hormonal methods.

Hormonal methods comprise of contraceptive pills either combined or progestin-only, injectables such as Depo-Provera injection, subdermal implants such as Implanon, hormone-releasing intrauterine system such as Mirena (levonorgestrel-releasing intrauterine system), vaginal ring such as Nuva Ring and patch such as

Ortho Vera. Copper intrauterine devices and barrier methods which include male and female condoms, diaphragm, sponge, cervical caps are the examples of non-hormonal methods (Singh *et al.*, 2014; Hubacher and Trussell, 2015; UNFPA, 2016).

The combined contraceptive pills contain synthetic female hormones that resemble the natural hormones; oestrogen and progesterone and acts by preventing ovulation. Contrary to the combined contraceptive pills, progestin-only pills contain only a single synthetic hormone resembling the natural progesterone. They act by suppressing the ovulation apart from changing the cervical mucus to inhibit sperm entry into the uterus (Rivera *et al.*, 1999). With perfect use, combined contraceptive pills may prevent pregnancy in 99.9% of couples whereas the progestin-only pills may prevent pregnancies in up to 99.5% of couples, slightly lower than the combined contraceptive pills (Miller, 1998).

Majority of the injectable contraceptives are long-acting and are either combined, for example Cyclofem and Mesigyna, or contain only progesterone-like hormone, such as the Depo-Provera (depot-medroxyprogesterone acetate, DMPA) and Noristerat (norethisterone enanthat, NET EN). The mode of action is similar to the oral contraceptive pills in which they prevent ovulation from taking place. The main advantage of these methods is that they are long-acting and needs relatively infrequent administration; only once in every 90 days for Depo-Provera, once every 60 days for Noristerat and once-monthly for Cyclofem and Mesigyna. Hormonal subdermal implants consist of progestin-only methods such as the Norplant and Implanon. They too prevent ovulation like other hormonal contraceptive methods,

but they are longer acting and last up to five years (Miller, 1998). The newer hormonal contraceptive methods; vaginal ring (Nuva Ring) and patch (Ortho Vera) were introduced in 2002 (Hatcher *et al.*, 2007). Their mechanism of actions are similar to that of other hormonal contraceptive methods; preventing ovulation and therefore fertilization (Frye, 2006).

The intrauterine contraceptive devices may be made up of plastic material or copper and also may release hormones as in the hormone-releasing intrauterine system or Mirena. The intrauterine contraceptive devices are believed to prevent pregnancies through impeding the sperms motility and action by creating a hostile environment that is toxic to the sperms through cellular and biochemical changes inherent to foreign body reaction in the sterile uterine cavity (Miller, 1998; Rivera *et al.*, 1999).

The barrier methods which include male and female condoms, diaphragm, sponge and cervical caps prevent pregnancies by imposing a physical barrier that prevent sperms from fertilizing the egg (Miller, 1998). The main advantage of this method is that it provides protection against HIV and other sexually transmitted infections particularly the male condoms (Miller, 1998). The major drawback of this method is that it is dependent on perfect use to achieve 97% effectiveness in preventing pregnancies. In typical use, it is only about 80% effective in preventing pregnancies (World Health Organization, 2004b).

In health clinics under the Ministry of Health, contraceptive pills, injections and sub dermal implants are hormonal methods provided whereas male condoms and copper intrauterine devices are the non-hormonal methods. Among the reversible methods, sub dermal implants and intrauterine devices are the most effective followed by Depo-Provera injections, contraceptive pills and male condoms (Centers for Disease Control and Prevention, 2011).

The contraceptive evaluation includes measures such as effectiveness, contraceptive failure rate, and contraceptive continuation and discontinuation rates. Contraceptive effectiveness measures the proportion of reduction in the probability of conception due to usage of contraception (United Nations, 1986). Contraceptive failures illustrate the occurrence of accidental pregnancies while using contraceptive method (United Nations, 1986). Contraceptive continuation rate is a measure of the proportion of contraceptive acceptors (a couple, woman or man who accepts a contraceptive method to delay or prevent the next conception) who are still using after a given period of time for example one year, contraceptive discontinuation refers to cessation of use of a contraceptive method (United Nations, 1986).

2.3. Non-modern methods

Non-modern or traditional methods (or natural methods) are methods that do not fulfil the definition of modern methods as defined earlier and therefore include methods such as withdrawal, abstinence, lactational amenorrhoea and fertility awareness approaches (Hubacher and Trussell, 2015; UNFPA, 2016). Fertility awareness include Standard Days Method, Calendar Rhythm Method, Two-Day

Method, Billings Ovulation Method, Symptothermal Method and the use of tools that assist in predicting the fertile period (Hubacher and Trussell, 2015). Folk methods such as herbal contraception are also included under traditional methods (Singh *et al.*, 2014). They however do not imply the level of effectiveness such as in the case with lactational amenorrhoea which is highly effective (Hubacher and Trussell, 2015).

In fertility awareness approaches, pregnancy is prevented by abstaining or avoiding from sexual intercourse during the fertile period; approximately nine days in the middle of the menstrual cycle where women are most likely to get pregnant should sexual intercourse took place. The Lactational Amenorrhea Method (LAM) relies on breastfeeding as a method for contraception and is between 98%-99% effective in preventing pregnancies should the woman who is breastfeeding is fully breastfeeding an infant, has not regained her menses, and recently gave birth in less than six months ago (Miller, 1998). Some women resort to natural methods as they view modern methods especially those that contain hormones are not "natural" and they are fearful of the effects these methods carry (Cheung and Free, 2005).

2.4. Types of contraception used in Malaysia

With the wide variety of contraceptive methods available, women are able to choose any method that they think suit them well (UNFPA, 2016). Based on previous studies conducted in Malaysia, the commonest methods used were hormonal methods (National Population and Family Development Board, 1974,1984,1994,2004; Norbanee *et al.*, 2008; Malaysia, 2011; Shiely and Saifuddin, 2014; Mansor *et al.*,

2015). According to a study conducted in Family Health Clinic HUSM, among women who were using contraception, 41.9% of them were using oral contraceptive pills and 20.9% were using hormonal injections (Norbanee *et al.,* 2008). However in another setting in the same state of Kelantan, women who visited the clinics under the Federation of Reproductive Health Associations Malaysia (FRHAM) preferred hormonal injections as compared to oral contraceptive pills whereby 32% were using injections and 27% were using oral contraceptive pills (Shiely and Saifuddin, 2014). Usage of non-hormonal methods such as condom which confers protection against sexually transmitted infections (Centers for Disease Control and Prevention, 2010; Shiely and Saifuddin, 2014) and copper intrauterine device that is highly effective were low (Ahmad *et al.*, 2010; Shiely and Saifuddin, 2014).

Apart from women's socio-demographic background and reproductive characteristics, there were many issues that surround usage of a contraceptive method which include their cultural values, gender roles and inequality, provider factors and barriers perceived by the women (Mohammadi *et al.*, 2006; Madden *et al.*, 2010; Najafi *et al.*, 2011; Peipert *et al.*, 2011; Keru, 2013; Najafi-Sharjabad *et al.*, 2013; Shahjahan *et al.*, 2013; Tsehaye *et al.*, 2013; Egede *et al.*, 2015; UNFPA, 2016). Besides these factors, the contraceptive attributes such as their safety, effectiveness, cost, ease of use and side effects also influenced women in deciding on a contraceptive method usage (Norbanee *et al.*, 2008; Wyatt *et al.*, 2014; Madden *et al.*, 2015).

2.5. Factors associated with hormonal contraceptive use

Various factors interplay to influence a woman's decision in choosing the contraceptive method that she wishes to use. Among the factors include socio-demographic background, reproductive and husband's characteristics, medical and clinical factors. As there were limited studies that directly focused on hormonal contraceptive use per se, literatures that discussed on overall contraceptive use and acceptance and their associated factors were also included.

a) Socio-demographic factors

Among the socio-demographic factors that contribute to hormonal contraceptive use include age of women, race and socioeconomic status such as education level, employment status and household income.

Based on previous studies, it was noted that the contraceptive methods use change with age of women whereby as the age of the woman increased, she was more likely to avoid usage of hormonal methods and tended to choose methods which were longer acting or permanent such as intrauterine contraceptive device (IUCD) (Centers for Disease Control and Prevention, 2010; Peipert *et al.*, 2011; Baig *et al.*, 2012; Kahraman *et al.*, 2012). Based on a study by Godfrey *et al.* (2011) who conducted a qualitative study to compare the perceptions about contraceptive methods and use among women after the age of 35 in New York, presence of medical condition as well as greater concern for health which include the importance of avoiding pregnancy are two very important factors being considered in addition to contraceptive method satisfaction and costs. Thus, they were more likely to use

contraceptive methods that have little to no side effects such as those that are non-hormonal in nature or the natural family planning method, and longer acting and not dependent on perfect use such as intrauterine contraceptive device.

Age of a woman was not only significantly associated with the contraceptive method, but more importantly, whether she would even consider the use of a method, to continue the use and comply to the contraceptive use (Oyedokun, 2007; Shiely and Saifuddin, 2014; Mansor *et al.*, 2015; Pazol *et al.*, 2015). Women at an older age were more compliant as they perceived the importance of avoiding pregnancy at this age, even more so if they have chronic medical conditions or had a bad obstetric history (Godfrey *et al.*, 2011). However, a study conducted in Kelantan found that the age of women was not a significant influence on contraceptive acceptance (Hamzah *et al.*, 2004).

Race of the women and her partner also played an important role in determining usage of contraceptive methods whereby diverse religious and cultural values are pervasive in different races including male authority which led to discontinuation or non-use of contraception and contraceptive choice as in the case of male condoms usage (Frost and Darroch, 2008; Centers for Disease Control and Prevention, 2010; Peipert *et al.*, 2011; Shiely and Saifuddin, 2014; Egede *et al.*, 2015; Mansor *et al.*, 2015). However, race and religion were not significant in influencing consistent contraceptive use in Kelantan which may be affected by the fact that majority of the respondents were predominantly Malay and Muslim (Shiely and Saifuddin, 2014).

Socioeconomic status including education level, employment status and household income influenced contraceptive acceptance whereby higher education level, higher income and being employed provided women with better knowledge and awareness regarding the availability of contraceptives and their services and hence, enhance accessibility to the services and influence women to utilize contraceptives (Hamzah *et al.*, 2004). Similarly, in Nigeria, the education level of women and income were associated with ever and current usage of contraceptive methods (Oyedokun, 2007).

In addition, socioeconomic status also influenced the contraceptive choice in which women with higher education level and higher income group tend to use hormonal methods (Frost and Darroch, 2008; Kahraman *et al.*, 2012). Apart from that, IUCD use was also found to be commoner among women with higher education level and income in the United States (Centers for Disease Control and Prevention, 2010). It was found that women with lower education level rely on permanent method of sterilization due to compliance issues (Centers for Disease Control and Prevention, 2010). For women with higher education level and currently working, these provide them with autonomy and purchasing power as they are more financially stable and empowered to weigh between the cost and benefit of using any contraceptive methods especially the highly effective methods (Kamal, 2015). The longer-acting reversible contraceptive methods such as intrauterine contraceptive devices and hormonal implants impose higher cost at start-up, thus may discourage women to use these methods (Mavranezouli, 2008). On the other hand, a study conducted in Kelantan in all clinics governed by the Federation of Reproductive Health Association of Malaysia (FRHAM), a voluntary family planning, sexual and reproductive health organization, found that education level, income and

employment were not significant in influencing consistency of contraceptives use (Shiely and Saifuddin, 2014).

b) Reproductive factors

Among the reproductive factors identified to influence use of hormonal contraceptive methods include duration of marriage, number of pregnancies and live births, history of abortion and stillbirth, desire for children in the future, breastfeeding status, menstrual regularity, experience with previous method and adverse effect from a previous method.

Pertaining to duration of marriage, there were limited studies that looked into this factor. It was noted that women with duration of relationship of less than 4 years were more likely to use condoms or contraceptive pills and less likely to use long acting methods that include IUCD, hormonal implants, injections and patches (Frost and Darroch, 2008). Unstable relationship or shorter duration of relationship led women to choose methods that are one-off or short-acting in nature such as condoms or emergency contraceptive pills, as the possibility of pregnancy is viewed as unlikely and they are ambivalent towards pregnancy (Frost and Darroch, 2008; Godfrey *et al.*, 2011).

Regarding history of childbirth and abortion, it was noted that with increase in the number of pregnancies and live births, the usage of modern contraceptive method increased although the use of hormonal methods particularly the pill became lesser

with addition in age of women (Baig *et al.*, 2012; Kahraman *et al.*, 2012; Kamal, 2015). Conversely, when a woman had the experience of child loss, this will reduce the likelihood of the woman to use an effective contraceptive method such as the modern contraception (Kamal, 2015) although the difference between hormonal and non-hormonal methods were not significant in terms of the number of abortions experienced (Norbanee *et al.*, 2008). Nonetheless, a study found that the number of births ever delivered by a woman or abortion experienced were not significant association in determining contraceptives acceptance (Hamzah *et al.*, 2004).

According to the WHO, for breastfeeding woman, if the woman is less than 6 weeks postpartum, she should not use combined hormonal contraceptives or progestogen-only injectables such as Depo-Provera (World Health Organization, 2015b). However, she can use progestogen-only pills and levonorgestrel and etonorgestrel implants (World Health Organization, 2015b). Meanwhile for women who are between 6 weeks to 6 months postpartum who are breastfeeding, they are generally advised not to use combined hormonal contraceptives but they can use progestogen-only pills and progestogen-only injectables and levonorgestrel and etonorgestrel implants without restrictions (World Health Organization, 2015b). If they are beyond 6 months postpartum, generally they can use combined hormonal contraceptives and other progestogen-only methods as mentioned previously (World Health Organization, 2015b).

The reason for advice against usage of combined hormonal contraceptives in women less than 6 weeks postpartum may be due to poor breastfeeding performance (women

who took combined hormonal contraceptives stopped breastfeeding earlier) and poor infant outcome (poor weight gain among babies whose mothers used combined hormonal contraceptives) although the relationship between these outcomes with usage of combined hormonal contraceptives in breastfeeding women were not established (Tepper *et al.*, 2015).

Women who are breastfeeding actively and more than 4 weeks postpartum can use the progesterone-releasing vaginal ring (World Health Organization, 2015b). For levonorgestrel-intrauterine device (LNG-IUD), if the woman is less than 48 hours postpartum she can generally use them (World Health Organization, 2015b). However, if she is between 48 hours postpartum and 4 weeks postpartum, she should not have an LNG-IUD inserted (World Health Organization, 2015b). She would have to insert after 4 weeks postpartum whereby she can use LNG-IUD without restriction (World Health Organization, 2015b). For women who experienced puerperal sepsis and they are breastfeeding, they should not have an insertion of an LNG-IUD (World Health Organization, 2015b).

Contraceptive use was mainly aimed to space or delay the next birth of child and was greatly influenced by the couple's desire for children in the future. According to Centers for Disease Control and Prevention (2010), among those using the reversible contraceptive methods, around half of the couples opted for contraceptive pills and about a quarter of them used the male condoms. If the couple had already completed their family, most relied on sterilization or longer acting methods (Frost and Darroch, 2008; Centers for Disease Control and Prevention, 2010; Baig *et al.*, 2012).

Furthermore, women who strongly wished to avoid pregnancies were more consistent and persistent in contraceptive use and practised a more effective method (Cheung and Free, 2005).

Experience with a contraceptive method in the past will influence women in future whether they will continue with the method if they are satisfied or discontinue its use (Centers for Disease Control and Prevention, 2010; Peipert *et al.*, 2011). Among hormonal users which include contraceptive pill users, depot injection users and patch users, more than half of the women discontinued the use due to experience of side effects (Centers for Disease Control and Prevention, 2010). Among the side effects experienced from hormonal methods include weight gain, nausea and headache (Cheung and Free, 2005). For male condom users, most of the discontinuation were due to partner's objection and interference with sexual intercourse (Centers for Disease Control and Prevention, 2010).

Another major side effect experienced with hormonal methods especially with injections and patches included menstrual changes (Cheung and Free, 2005; Centers for Disease Control and Prevention, 2010) which posed a great impact as based on a study done by Egarter *et al.* (2013), the reasons for choosing combined oral contraceptives and condoms were due to regular menstrual bleeding and relief from menstrual pain.