

**QUESTIONNAIRE DEVELOPMENT AND
DETERMINATION OF FACTORS ASSOCIATED
WITH KNOWLEDGE, ATTITUDE AND
PRACTICE ON PROVISION OF LONG-ACTING
REVERSIBLE CONTRACEPTION AMONG
PRIMARY HEALTHCARE WORKERS IN
KELANTAN**

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UNIVERSITI SAINS MALAYSIA

2024

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KELANTAN**

By

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**Dissertation submitted in partial fulfilment of the
requirements for the degree of Doctor of Public
Health (Family Health)**

February 2024

ACKNOWLEDGEMENTS

Bismillahirrahmanirrahim.

In the name of Allah, the Most Compassionate, the Most Merciful. Praise to Allah s.w.t., who has eased my journey with His divine guidance, making each step more bearable and purposeful. Special appreciation is extended to those who played pivotal roles in completing my Doctor of Public Health (DrPH) research.

My heartfelt thanks go to my main supervisor, Associate Prof. Dr. Tengku Alina Tengku Ismail. I am forever indebted to her for invaluable guidance; each uttered word reflects the depth of her wisdom in the field. Her meticulous approach and constant support greatly influenced the course of my research. I am deeply thankful to my co-supervisor, Dr. Suhaily Mohd Hairon, for her support and guidance. In moments of uncertainty, her expertise lit the path forward. Both have tirelessly helped me from the initial stage to the completion of this study.

I am thankful to the Malaysian Ministry of Health and the Kelantan State Health Department for facilitating the data collection process. Appreciation goes to the healthcare workers in Kelantan who participated in the study, generously offering their time amidst busy schedules. Special acknowledgement is reserved for the experts who meticulously reviewed the questionnaire and offered invaluable input during the development phase.

I extend my thanks to the knowledgeable lecturers who generously shared their expertise throughout the DrPH program, providing me with a robust foundation. Sincere appreciation also goes to my colleagues, especially the girls (Nur Akmal, Afiqah Syamimi, Siti Fatimah and Nor Faizah). Their words of encouragement had been a lifeline during challenging moments. The continuous exchange of updates, insightful discussions and generosity in sharing knowledge had made the academic pursuit less challenging and enjoyable.

To my beloved husband, Mohd Fadhil Azrie Yahya, heartfelt thanks for being a pillar of support. His presence, assistance and emotional encouragement have made this journey more manageable. He also has taught me valuable life lessons that I will remember for the rest of my life. Thanks to my daughter, Nur Faadhilah Mohd Fadhil Azrie, whose understanding and patience have been my source of strength throughout this demanding period. Despite the limited time and attention that I had dedicated to her, she still put a beautiful, innocent smile on her little face. Moreover, the presence of my husband and daughter at the university on the day of the thesis defence was truly appreciated. My deepest gratitude goes to my parents (Jusoh Omar and Siti Norbe Anas), mother-in-law (Siti Fatimah Ab Lah), and family for their trust and support.

DECLARATION

I, Nur Nabila binti Jusoh, hereby declare that the content presented in this thesis is entirely my own. Any information from external sources was clearly acknowledged in the thesis. This thesis was written according to the alternative format that has been approved by the School of Medical Sciences, Universiti Sains Malaysia.

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LIST OF SYMBOLS

χ^2	Chi-square
$<$	Less than
$>$	More than
$=$	Equal to
\leq	Less than and equal to
\geq	More than and equal to
$\%$	Percentage
α	Alpha
b	Beta

LIST OF ABBREVIATIONS

AAP	American Academy of Pediatrics
ACOG	American College of Obstetricians and Gynecologists
CFA	Confirmatory factor index
CFI	Comparative fit index
CI	Confidence interval
CVI	Content validity index
EFA	Exploratory factor analysis
FRHAM	Federation of Reproductive Health Associations Malaysia
FVI	Face validity index
GFI	Goodness of fit index
HCW	Healthcare worker
IRT	Item response theory
IUCD	Intrauterine contraceptive device
IUS	Intrauterine system
KAP	Knowledge, attitude and practice
KMO	Kaiser-Meyer-Olkin
LARC	Long-acting reversible contraception
MI	Modification indices
MOH	Ministry of Health
NHMS	National Health and Morbidity Survey
NPFDB	National Population and Family Development Board
OGSM	Obstetrical and Gynaecological Society of Malaysia

RMSEA	Root mean square error of approximation
SARC	Short-acting reversible contraception
SD	Standard Deviation
SPSS	Statistical Package for the Social Sciences
TLI	Tucker-Lewis Index
WHO	World Health Organization

ABSTRAK

PEMBANGUNAN BORANG SOAL SELIDIK DAN PENENTUAN FAKTOR-FAKTOR YANG BERKAITAN DENGAN PENGETAHUAN, SIKAP DAN AMALAN TERHADAP PEMBEKALAN KONTRASEPSI BOLEH UBAH JANGKA MASA PANJANG DALAM KALANGAN KAKITANGAN KESIHATAN PRIMER DI KELANTAN

Latar belakang: Kontrasepsi boleh ubah jangka masa panjang (LARC) adalah strategi yang penting dalam mencegah kehamilan yang tidak dirancang, namun penggunaannya masih rendah di Malaysia. Kakitangan kesihatan (HCWs) mempunyai pengaruh besar terhadap penggunaan LARC, oleh itu penting untuk menilai pengetahuan, sikap, dan amalan (KAP) mereka terhadap pembekalan LARC.

Objektif: Kajian ini bertujuan untuk menilai pengetahuan, sikap, dan amalan dalam pembekalan LARC dan faktor-faktor berkaitan dalam kalangan kakitangan kesihatan primer di Kelantan menggunakan borang soal selidik yang baru dibangunkan.

Kaedah: Kajian ini dijalankan dari Oktober 2022 hingga September 2023, melibatkan kakitangan kesihatan di klinik kesihatan kerajaan di Kelantan. Kajian ini terbahagi kepada dua fasa. Fasa 1 fokus kepada pembangunan dan pengesahan borang soal selidik yang baru. Borang soal selidik ini dibangunkan melalui tinjauan literatur, pendapat pakar dan perbincangan dengan HCWs. Kemudian, borang soal selidik itu disahkan menggunakan pengesahan kandungan, temu bual kognitif dan penilaian psikometrik struktur dalaman. Bahagian pengetahuan dianalisis menggunakan teori respons item logistik dua parameter (2-PL IRT). Analisis penerokaan faktor (EFA) dan

analisis pengesahan faktor (CFA) dijalankan untuk bahagian sikap dan amalan. Pengesahan psikometrik ini melibatkan 444 HCWs yang dipilih secara rawak. Seterusnya, Fasa 2 melibatkan kajian hirisan lintang untuk menilai KAP dan faktor-faktor berkaitan dalam kalangan 190 HCWs yang dipilih secara rawak dari empat daerah di Kelantan. Borang soal selidik sendiri yang baru disahkan telah digunakan. Skor keseluruhan ditukarkan kepada skor peratusan. Data kemudiannya dianalisis menggunakan analisis deskriptif dan regresi linear untuk penilaian menyeluruh. Pemboleh ubah bersandar adalah skor-skor KAP.

Keputusan: Borang soal selidik baru, yang dinamakan sebagai 'KAPP-LARC', terdiri daripada 39 item akhir merangkumi tiga bahagian: 15 mengenai pengetahuan, 13 mengenai sikap, dan 11 mengenai amalan. Bahagian pengetahuan menunjukkan nilai kesukaran dan diskriminasi yang boleh diterima. Model akhir untuk bahagian sikap dan amalan menunjukkan kesesuaian model yang memuaskan, dengan semua faktor mempunyai kebolehpercayaan komposit yang boleh diterima, seperti yang ditunjukkan oleh nilai Raykov's rho yang melebihi 0.60. Skor purata keseluruhan untuk pengetahuan, sikap, dan amalan adalah masing-masing 69.1%, 48.1%, dan 64.1%. Pengetahuan tentang pembekalan LARC berkait secara positif dengan status sebagai seorang doktor (larasan $b = 8.40$; CI 95%: 3.76, 13.05; $p < 0.001$), menerima latihan formal LARC (larasan $b = 7.47$; CI 95%: 2.81, 12.12; $p = 0.002$), dan kesedaran tentang perkhidmatan pemasangan LARC di fasiliti kesihatan (larasan $b = 8.92$; CI 95%: 0.82, 17.02; $p = 0.031$). Selain itu, HCWs dengan pengalaman yang lebih lama dalam bidang Kesihatan Ibu dan Anak menunjukkan sikap (larasan $b = 0.36$; CI 95%: 0.23, 0.50; $p < 0.001$) dan amalan (larasan $b = 0.74$; CI 95%: 0.43, 1.04; $p < 0.001$) yang lebih positif terhadap pembekalan LARC.

Kesimpulan: Borang soal selidik ini menunjukkan sifat psikometrik dan kebolehpercayaan yang memuaskan, menjadikannya instrumen yang sesuai untuk menilai KAP mengenai penyediaan LARC dalam kalangan HCWs. Secara keseluruhan, skor pengetahuan dan amalan adalah lebih tinggi daripada skor sikap. Fokus terhadap latihan, terutamanya pada jururawat, kesedaran tentang perkhidmatan dan pengalaman dalam Kesihatan Ibu dan Anak boleh menyumbang kepada penambahbaikan pembekalan LARC.

Kata Kunci: Kontrasepsi boleh ubah jangka masa panjang; kakitangan kesihatan primer; borang soal selidik; pengesahan; KAP

ABSTRACT

QUESTIONNAIRE DEVELOPMENT AND DETERMINATION OF FACTORS ASSOCIATED WITH KNOWLEDGE, ATTITUDE AND PRACTICE ON PROVISION OF LONG-ACTING REVERSIBLE CONTRACEPTION AMONG PRIMARY HEALTHCARE WORKERS IN KELANTAN

Background: Long-acting reversible contraception (LARC) is an important strategy in preventing unintended pregnancies, but its utilisation in Malaysia remains low. Healthcare workers (HCWs) can significantly influence LARC uptake, thus assessing their knowledge, attitude, and practice (KAP) on LARC provision is important.

Objective: The aim was to assess the knowledge, attitude and practice on the provision of LARC and their associated factors among primary HCWs in Kelantan using a newly developed questionnaire.

Methodology: The study was conducted from October 2022 to September 2023, involving HCWs in government health clinics in Kelantan. It is comprised of two phases. Phase 1 focused on developing and validating a new questionnaire. The questionnaire was developed through a literature review, expert consultations and discussions with HCWs. Then, the questionnaire was validated using content validity, cognitive interviews and psychometric evaluation of internal structure. The knowledge section underwent a two-parameter logistic item response theory (2-PL IRT) analysis. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted for the attitude and practice sections. This psychometric validation involved

444 randomly selected HCWs. Subsequently, Phase 2 involved a cross-sectional study assessing KAP and associated factors among 190 randomly selected HCWs from four districts in Kelantan. The newly validated self-administered questionnaire was utilised. Total scores were transformed into percentage scores. The data was then subjected to descriptive analysis and linear regression for comprehensive evaluation. The dependent variables were the KAP scores.

Results: The new questionnaire, named ‘KAPP-LARC’, comprised 39 final items across three sections: 15 in knowledge, 13 in attitude and 11 in practice. The knowledge section displayed acceptable difficulty and discrimination values. The final model for the attitude and practice section exhibited satisfactory model fitness, with all factors having acceptable composite reliability, indicated by Raykov’s rho values greater than 0.60. The total mean percentage scores for knowledge, attitude and practice were 69.1%, 48.1% and 64.1%, respectively. Notably, knowledge regarding LARC provision was positively associated with being a doctor (adjusted $b = 8.40$; 95% CI: 3.76, 13.05; $p < 0.001$), receiving formal LARC training (adjusted $b = 7.47$; 95% CI: 2.81, 12.12; $p = 0.002$) and awareness of LARC insertion services in healthcare facilities (adjusted $b = 8.92$; 95% CI: 0.82, 17.02; $p = 0.031$). Moreover, HCWs with more years of experience in Maternal and Child Health exhibited more positive attitudes (adjusted $b = 0.36$; 95% CI: 0.23, 0.50; $p < 0.001$) and practices (adjusted $b = 0.74$; 95% CI: 0.43, 1.04; $p < 0.001$) towards LARC provision.

Conclusion: The questionnaire exhibited satisfactory psychometric properties and reliability, making it a suitable instrument for assessing KAP regarding LARC provision among HCWs. Overall, the scores for knowledge and practice were

relatively higher than the scores for attitude. Focusing on training, especially on nurses, awareness of service and Maternal and Child Health experience could contribute to the improvement of LARC provision.

Keywords: Long-acting reversible contraception; healthcare workers; questionnaire; validation; KAP

CHAPTER 1

INTRODUCTION

1.1 Burden of unintended pregnancies

Unintended pregnancy refers to both unwanted pregnancies (occurring when no children or no more children are desired) and mistimed pregnancies (occurring earlier than desired) (CDC, 2021). Unintended pregnancies have negative impacts on both maternal and fetal health. A study conducted in India revealed a significant association between unintended pregnancies and adverse outcomes such as pre-eclampsia and postpartum haemorrhage (Dehingia *et al.*, 2020). Besides, unintended pregnancies were associated with non-use of folic acid pre-pregnancy, fewer antenatal visits and less social support (Goossens *et al.*, 2016). In Brazil, women facing unplanned pregnancies exhibited patterns of inadequate antenatal care initiation, low antenatal care attendance, and engagement in risky behaviours like alcohol consumption and smoking (Vieira *et al.*, 2020). Globally, an alarming 61% of unintended pregnancies resulted in abortion (Bearak *et al.*, 2020). Beyond the direct health implications, unintended pregnancies contribute to adverse societal outcomes, including reduced educational achievement, lower workforce participation and economic instability (Sonfield *et al.*, 2013).

Within the Malaysian context, the prevalence of unintended pregnancies remains a significant concern, affecting 33.0% to 42.9% of women, according to national surveys (MOH, 2022; Yusof *et al.*, 2018). Besides, the unmet need for contraception, referring to fecund women wishing to delay or stop childbearing but

not utilising any form of contraception, was 26.7%, the highest among other Asian countries (MOH, 2022). Despite a reported abortion rate of only 1.0% among women of reproductive age in Malaysia (MOH, 2022), underreporting is likely due to the sensitive nature of the issue and participants' social desirability bias. According to the data from Reproductive Rights Advocacy Alliance Malaysia's hotline, the top four most common reasons for seeking termination of unintended pregnancies in Malaysia were closed spacing, health concerns, teenage pregnancy and having a high number of children (Rawther *et al.*, 2020).

The majority of unintended pregnancies result from either not using contraceptives or using them inconsistently and incorrectly (CDC, 2021). Addressing this issue, long-acting reversible contraception (LARC) emerges as a highly effective choice and its effectiveness does not rely on users' compliance. The American College of Obstetricians and Gynecologists (ACOG) recommended LARC as the primary choice for most women, expanding this endorsement to adolescents to prevent unintended pregnancies (ACOG, 2009). Additionally, the International Federation of Gynecology and Obstetrics (FIGO) highlighted the significance of LARC in postpartum contraception to prevent unintended pregnancies and unsafe abortions (Faundes *et al.*, 2020).

A large prospective cohort study, the Contraceptive CHOICE Project, involving 9000 women in St. Louis, United States, was conducted to assess the effectiveness of LARC. After receiving standard contraceptive counselling based on effectiveness-tiered guidance, these women were provided with any reversible contraceptive methods of their choice at no cost. Improved access in terms of cost,

availability and knowledge of LARC had significantly reduced teenage pregnancy, overall abortion and repeat abortion rates, when compared to Kansas City which shares a similar population size and demographic profile to St. Louis City (Birgisson *et al.*, 2015). Besides, in a study involving 1,393 participants using LARC, a total of five unintended pregnancies occurred, while in the control group (non-LARC use) comprising 958 participants, there were a total of 45 unintended pregnancies. Thus, the incidence rate of unintended pregnancies was lower for LARC users (0.36 per 100 women) compared to 4.6 per 100 women for those not using LARC (Winner *et al.*, 2012). Therefore, LARC is a practical and effective solution to prevent unintended pregnancies.

1.2 Overview of LARC

LARC refers to contraceptive methods which provide effective protection for a minimum of three years without requiring ongoing compliance once initiated (Espey and Ogburn, 2011). Globally, the available LARC is either an implant or intrauterine contraceptive device (IUCD). The IUCD can be classified into two types which are copper IUCD and levonorgestrel IUCD. The latter is also known as the levonorgestrel intrauterine system (IUS) (WHO, 2022).

According to the guideline provided by the National Institute for Health and Care Excellence (NICE, 2019), the depot medroxyprogesterone (DMPA) injection is categorised as one of the LARC methods. However, according to the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (2014), recent trends have shifted away from including the contraceptive injections in the LARC category.

This change is attributed to its lower effectiveness compared to IUCD and implant, and its user-dependent nature which requires the clients to return every 12 weeks for a repeat dose. It is noteworthy that prominent organisations such as the World Health Organization (WHO), American College of Obstetricians and Gynecologists (ACOG), Federation of Reproductive Health Associations Malaysia (FRHAM) and Obstetrical and Gynaecological Society of Malaysia (OGSM) do not recognise the contraceptive injection as part of LARC methods (Espey and Hofler, 2017; OGSM and FRHAM, 2016; WHO, 2022).

Various implants are available, including Implanon, which consists of a single rod containing etonogestrel; Jadelle with two rods containing levonorgestrel; Levoplant comprising two rods with levonorgestrel; and Norplant, which includes six capsules (WHO, 2022). Norplant was discontinued in 2008 and is no longer available for insertion. Among these, Implanon is the most used type of implant (Espey and Hofler, 2017; Pearson *et al.*, 2022). Implanon was first introduced in Malaysia in 2002 (Mastor *et al.*, 2011). It is placed subdermally in the upper arm by trained healthcare workers (HCWs) and is labelled for use for up to three years. An updated model was later released, which is radio-opaque, allowing visibility on X-rays and features an improved insertion device (WHO, 2022). Its primary mechanism of action is by inhibiting ovulation, thickening cervical mucus and suppressing the endometrium (Espey and Hofler, 2017).

The copper IUCD is a small T-shaped plastic frame with copper sleeves, designed for use between three to ten years depending on the type and brand (Bahamondes *et al.*, 2020; Pearson *et al.*, 2022). In contrast, levonorgestrel IUS is a T-

shaped device which steadily releases a low amount of levonorgestrel hormone. The copper IUCD works by inducing chemical changes that damage sperms before fertilisation, whereas the mechanism of action for levonorgestrel IUS was similar to that of the implant (Bahamondes *et al.*, 2020; Espey and Hofler, 2017). In Malaysia, the predominant brand for levonorgestrel IUS is Mirena, while common brands for copper IUCD are Multiload, Mona Lisa and Nova-T (Nadzirah, 2022).

1.3 Prevalence of LARC

The United Nations (2019) reported that the estimated global prevalence of IUCD use among women of reproductive age was 8.4%, while implant usage was 1.2%. The highest IUCD usage was observed in Eastern and South-Eastern Asia, notably in countries like China, Vietnam and the Democratic People's Republic of Korea, probably owing to strict family planning policies aimed at population control (Ngo, 2020). In contrast, Sub-Saharan Africa demonstrated the highest implant usage prevalence at 4.5% (United Nations, 2019), a significant increase over the past decade, surpassing combined gains in the usage of contraceptive injections, pills and IUCD (Jacobstein, 2018). This rise can be attributed to countries' commitment to diversify contraceptive methods, cost-reduction efforts by donors and manufacturers, and the expansion of family planning services (Jacobstein, 2018).

The report by the United Nations (2019) also highlighted that the prevalence of LARC was half that of short-acting reversible contraception (SARC), which includes contraceptive injections, male condoms and pills (21.9%). This finding was supported by a systematic review examining contraceptive use among post-partum women in low- and middle-income countries (Dev *et al.*, 2019). The majority of the

studies included in the review showed significantly lower LARC usage compared to SARC, with contraceptive injections being the most common choice among modern contraceptive users, followed by pills and condoms. A similar trend was seen in Europe, where a study among women in 11 European countries showed that the usage of SARC was almost three times higher compared to LARC usage (Merki-Feld *et al.*, 2018). This trend is concerning because inconsistent or incorrect use of SARC significantly contributes to unintended pregnancies (CDC, 2021).

In Malaysia, based on the nationwide survey conducted by the National Population and Family Development Board (NPFDB, 2014), only 2.8% of married women in the reproductive age group used IUCD, while implant usage was reported at 0.6%. The prevalence of IUCD usage among Malaysian women varied between 2.2% and 4.5% from 1984 to 2014. The rate was significantly lower compared to pills, the most preferred modern method in Malaysia, with a prevalence of 14.9%. Unfortunately, there is no data prior to 2014 to assess the trend of implant usage. In the recent National Health and Morbidity Survey (NHMS), among the 42.8% of women using contraception, merely 6.5% opted for IUCD and 5.5% chose implants (MOH, 2022). The NHMS report also showed that the widely used contraceptive methods included pills (33.1%), injectables (16.4%), withdrawal (9.6%) and male condoms (9.0%). These preferences are consistent with global patterns and those observed in other low- and middle-income countries, as described earlier (Dev *et al.*, 2019; United Nations, 2019).

There are several smaller-scale local studies which explored LARC usage, as part of their research on general contraceptive methods. For instance, Ibrahim *et al.* (2020) found that 65.5% of Kelantanese women who recently underwent caesarean deliveries utilised modern contraception one year postpartum. However, within this high-risk group, only 6.5% opted for LARC. In a different context, women who attended a polyclinic in Selangor exhibited a LARC usage prevalence of 4.9% (Mansor *et al.*, 2015). Additionally, a study conducted at government and private clinics in Kota Kinabalu, Sabah, showed a higher LARC usage rate of 18.2% (Lasimbang *et al.*, 2018). The latter study demonstrated a higher percentage because it measured the proportion of women who had ever used the method, not just those currently using it.

1.4 Advantages of LARC

The LARC methods are recognised as highly effective contraceptive methods, with a pregnancy rate of less than one per 100 women within the first year of use, comparable to surgical sterilization (WHO, 2022). There is no difference between typical and perfect use of LARC because it does not necessitate any client action post-insertion, implying that the clients cannot influence the efficacy of the method. The Contraceptive CHOICE Project, a large cohort study, revealed that LARC methods were 20 times more effective compared to pills, patches or rings (Secura, 2013). Besides, LARC has limited contraindications and is safe for various groups, such as adolescents, women over 40 years old, nulliparous women, post-abortion women and lactating women (Espey and Hofler, 2017; WHO, 2022). The American Academy of

Pediatrics (AAP) further supports LARC use as the first-line method for adolescents, emphasising both its effectiveness and safety (AAP, 2014).

In terms of continuation rate, LARC surpasses other methods. Research by Diedrich *et al.* (2015) demonstrated a higher continuation rate at three years of use among LARC users (67.2%), compared to 31.0% among non-LARC users. Besides, a systematic review reported a high combined 12-month continuation rate of 84.0% for LARC (Diedrich *et al.*, 2017). Another advantage of LARC is its infrequent administration, requiring visits to healthcare facilities only once every three to ten years.

From a cost perspective, although LARC methods have a higher upfront cost compared to SARC, Trussell *et al.* (2015) demonstrated that LARC becomes cost-saving within the initial two years of use. Thus, LARC remains cost-effective even if the clients do not use LARC for its full intended duration. Additionally, a budget impact analysis in Brazil revealed that the use of copper IUCD or implant for preventing unintended pregnancies would result in cost savings over a five-year period, amounting to \$422,431,269 and \$302,852,972, respectively. The study concluded that LARC methods were considered cost-effective (Farah *et al.*, 2022). However, it is essential to note that these findings were specific to their countries, and variations in health systems between countries should be considered when generalising it to the Malaysian context.

1.5 Provision of LARC in Malaysia

The public sector has been the primary provider of contraception services in Malaysia since the establishment of the family planning program in the 1960s (Johnson, 1979). This is supported by a study which showed that the majority of clients (70.8%) obtained contraceptive supplies from government clinics, whereas 26% of the clients obtained them from private clinics or pharmacies (Lai *et al.*, 2021). The NPFDB which is responsible for population and family development, plays a minor yet important role in service provision (Lai *et al.*, 2021). Additionally, the FRHAM has reduced its family planning service provision involvement due to budget constraints and a shift in focus towards advocacy activities related to broader gender and reproductive health issues.

The cost for Implanon insertion both at NPFDB and private clinics is RM500, with a removal cost of RM100 (NPFDB, 2023; Suraya, 2022). The cost for IUCD insertion is RM80, with a removal cost of RM20 at NPFDB. However, the cost for IUCD insertion is considerably higher at private clinics with RM600. The costs of LARC at private clinics are approximate and vary between specific clinics. With regards to SARC, the cost for contraceptive pills at NPFDB ranges from RM5 to RM52, while the injection costs RM36 (NPFDB, 2023). Despite SARC being relatively cheaper than LARC, the frequency of administration must be considered where contraceptive pills are given monthly, and injections are administered three-monthly. Nonetheless, government healthcare services are heavily subsidised for Malaysian citizens, whereby contraceptives are accessible at government health clinics nationwide for a minimal fee of RM1 per visit (Law *et al.*, 2019).

In terms of prescriptions, the Ministry of Health Medicines Formulary (MOHMF) has categorized LARC differently (MOH, 2024). The levonorgestrel IUS falls under category A*, permitting only consultants and specialists to prescribe it. Implanon is categorized as A/KK, allowing prescription by consultants, specialists, or family medicine specialists. In contrast, the copper IUCD is designated as category B, permitting medical officers to prescribe it. Thus, only Implanon and copper IUCD are available in primary healthcare facilities.

In Malaysia, only doctors have the authority to insert LARC (Bateson *et al.*, 2017), but nurses also play a major role in providing contraceptive services. Nurses adopt personalised care where they provide services to the entire family within their designated area of operation (MOH, 2015). This approach not only enables nurses to establish trust and rapport with clients but also positions them to effectively influence contraceptive decisions. Such an approach also aligns with the clients' preference for an intimate and friendly relationship with their HCWs during contraceptive discussions, considering the sensitive and personal nature of these discussions (Dehlendorf *et al.*, 2014a).

The LARC Guidelines for Malaysia, established by OGSM and FRHAM in 2016, underscore the growing importance of LARC in the country (OGSM and FRHAM, 2016). It provides crucial recommendations for HCWs involved in LARC provision. The guideline suggests routine offering of immediate postpartum IUCD insertion as contraception; and emphasises the suitability of LARC to nulliparous women, women with a history of ectopic pregnancy and flexible LARC insertion throughout the menstrual cycle. Beyond clinical considerations, it also addresses

sociocultural and religious influences on family planning practices, particularly within the predominantly Muslim population. It highlights that women using implants should be able to continue daily religious rituals despite having irregular vaginal bleeds as a side effect.

1.6 Influence of HCWs on LARC provision

HCWs play a crucial role in LARC provision due to the nature of these methods requiring clinical expertise for insertion and removal (Murphy *et al.*, 2016). It cannot be bought online or over the counter. Referred to as ‘street-level bureaucrats’, the HCWs directly engage with the public to deliver service, exercising freedom and authority in procedure and policy implementation (Lipsky, 1980). According to Tavrow (2010), HCWs can influence clients' access to contraception by either misinforming clients about the method, denying service or discouraging them from obtaining service.

The pivotal role of HCWs as information disseminators for LARC cannot be overstated. Previous studies highlighted the significant influence of HCWs in educating clients about LARC. For instance, a study among Implanon users in Malaysia revealed that 62.9% of them acquired knowledge about Implanon through HCWs prior to its use (Mastor *et al.*, 2011). Similarly, a study in Kota Kinabalu, Sabah, showed that 66.3% of women relied on doctors and other health professionals for information about contraception, surpassing alternative sources like friends, media, internet or family (Lasimbang *et al.*, 2018). This finding aligns with a study in Norway by Bratlie *et al.* (2014) which found doctors and nurses as primary sources of

contraceptive information, indicating a universal pattern in the role of HCWs in promoting LARC.

The HCWs' attitude about LARC will influence their decision to recommend LARC. For example, HCWs sometimes impose unjustified restrictions which are beyond the updated WHO eligibility criteria (WHO, 2015). In Oman, approximately one-fourth of primary HCWs believed that IUCD increased the risk of pelvic inflammatory disease (PID), sexually transmitted infections (STI) and infertility. This belief influenced their reluctance to recommend it to clients, thereby denying clients' rights and limiting their contraceptive choices (Shidhani *et al.*, 2020).

Furthermore, HCWs can unconsciously discourage clients from considering LARC, even without direct refusal of services. Disparities exist in contraceptive counselling, with LARC often receiving less attention than SARC. A study by Bratlie *et al.* (2014) showed that only 35% of general practitioners frequently discussed LARC during counselling, compared to 93% of them who frequently discussed pills. Additionally, HCWs tend to underestimate clients' interest in receiving information about LARC, impacting their counselling approach. A European study reported that only 38% of HCWs believed women were interested in detailed information about LARC, despite 73% of women expressing willingness to consider LARC if provided with extensive information (Merki-Feld *et al.*, 2018).

Moreover, HCWs exert influence on LARC uptake through provider self-disclosure, where they share their own contraceptive experiences with clients (McLean *et al.*, 2017). Research indicates that over one-third of HCWs had disclosed their personal contraceptive experiences to clients (McLean *et al.*, 2017). In a study

conducted among women undergoing induced abortion in the United States, it was found that HCWs' personal disclosure of IUCD use was significantly associated with the decision to use an IUCD (OR 8.1, 95% CI: 3.8, 17.2) (Benson *et al.*, 2012). This highlights the impact of HCWs' personal narratives on patients' contraceptive choices, emphasising the role of provider self-disclosure in influencing LARC decisions.

There is supporting evidence supporting the correlation between the KAP of LARC provision and LARC uptake in the general population. In a case-control study conducted in China, HCWs with video training exhibited higher knowledge scores on LARC compared to the control group. Subsequently, clients attended by HCWs from the trained group reported a higher percentage of choosing LARC as a contraceptive method than those in the control group (24.6% vs. 2.4%) (Xiong *et al.*, 2021). Additionally, findings from a randomized, controlled trial demonstrated that clients attended by the HCWs in the intervention group, which underwent LARC training on counselling and clinical practice, were twice as likely to choose LARC method compared to the control group (Harper *et al.*, 2014). In summary, improved HCWs' KAP correlate positively with increased LARC uptake among clients.

1.7 Problem statement

The usage of LARC is recognised by reputable organisations worldwide for its safety, effectiveness, cost-effectiveness, long duration and immediate fertility return (AAP, 2014; ACOG, 2009; Faundes *et al.*, 2020; WHO, 2015). Despite these advantages, LARC usage in Malaysia has remained persistently low over the decades, especially when compared to SARC (MOH, 2022). Even among high-risk clients, the

uptake of LARC remains significantly low, creating a substantial gap in meeting the contraceptive needs of the population.

The low LARC usage in Malaysia raises several critical issues. Firstly, it can lead to a high unmet need for effective contraception, exacerbating the risk of unintended pregnancies. Unintended pregnancies pose risks to maternal and child health and have broader societal implications, including reduced educational attainment, decreased workforce participation and economic instability (Hall *et al.*, 2017; Sonfield *et al.*, 2013). In the Malaysian context, where the unmet need for contraception and unintended pregnancies are worrying, it is essential to take public health measures aimed at improving LARC services and increasing its uptake.

One of the key factors contributing to the low LARC uptake is the influential role of HCWs in the contraceptive decision-making process. They are vital sources of information for individuals seeking contraceptive advice. Besides, documented misconceptions and negative beliefs about LARC methods among HCWs can lead to biased counselling and potentially deter clients from choosing LARC (Shidhani *et al.*, 2020). Furthermore, HCWs tend to emphasise counselling on SARC over LARC options, resulting in disparities in the information provided to clients (Bratlie *et al.*, 2014). Additionally, there is a notable discrepancy between HCWs' perception of client interest and the actual willingness of clients to consider LARC (Merki-Feld *et al.*, 2018).

Several questionnaires have been developed to assess the knowledge, attitude and practice (KAP) of LARC provision among HCWs. However, the validity and reliability of these tools remain inadequately explored. Furthermore, the existing

research predominantly focuses on IUCD and seldom includes assessments of implant, leaving a significant gap in understanding the complete landscape of LARC provision. In Malaysia, the exploration of HCWs' KAP related to LARC provision is limited. An existing study conducted among Malaysian doctors in both private and government healthcare facilities sheds light on this issue (Chew *et al.*, 2018). Even so, the questionnaire was not properly validated, did not assess the KAP of implant and was conducted among doctors only.

1.8 Study rationale

Increasing LARC uptake is a key strategy to reduce the unmet need for contraception and prevent unintended pregnancy. Given the crucial role of HCWs in facilitating LARC uptake, it is essential to assess their KAP regarding LARC provision. Therefore, one of the rationales of this study is to develop a valid and reliable tool to evaluate primary HCWs' current KAP on LARC provision. This tool will allow for the collection of high-quality data, enabling researchers to make meaningful and robust conclusions.

The questionnaire will help to identify the common misinformation, misconceptions and specific needs pertaining to LARC provision. Furthermore, the level of KAP scores among HCWs can provide policymakers with valuable insights regarding the magnitude of the challenges in LARC provision. If the KAP scores are low, intervention or a new policy is warranted, to improve family planning services. The intervention can be tailored to address specific areas based on the study findings.

In addition, this study will also allow a better understanding of factors associated with KAP among HCWs to overcome issues in LARC provision. By identifying the significant associated factors, future intervention strategies can be focused on HCWs or health facilities with specific characteristics. As a result, the targeted intervention will be more effective and cost-saving.

Besides, this study provides a new validated questionnaire to assess KAP among HCWs in Malaysian settings. In the future, the questionnaire can be used by other researchers in other settings to further explore LARC provisions. Additionally, this questionnaire can be employed to objectively measure the effectiveness of interventions by conducting pre- and post-intervention surveys. Such assessment can determine whether the intervention is performing following expectations and then improvement can be made if necessary.

1.9 Research questions

1. Is the new questionnaire valid to assess the knowledge, attitude and practice on LARC provision among primary healthcare workers in Kelantan?
2. What are the knowledge, attitude and practice scores on LARC provision among primary healthcare workers in Kelantan?
3. What are the factors associated with knowledge, attitude and practice scores on LARC provision among primary healthcare workers in Kelantan?

1.10 Objective

General objective

To assess the knowledge, attitude and practice on the provision of LARC and their associated factors among primary healthcare workers in Kelantan using a newly developed questionnaire.

Specific objectives

1. To develop and validate a new questionnaire assessing the knowledge, attitude and practice on the provision of LARC among primary healthcare workers in Kelantan.
2. To determine the mean scores of knowledge, attitude and practice on the provision of LARC among primary healthcare workers in Kelantan using the newly developed questionnaire.
3. To determine the associations between sociodemographic, experience and facility-related factors with knowledge, attitude and practice scores on the provision of LARC among primary healthcare workers in Kelantan.

1.11 Research hypotheses

1. The newly developed questionnaire is valid and reliable to be used for assessment of the knowledge, attitude and practice on LARC provision among primary healthcare workers in Kelantan.
2. There are significant associations between sociodemographic characteristics, experience and facility-related factors with knowledge, attitude and practice scores on LARC provision among primary healthcare workers in Kelantan.

CHAPTER 2

LITERATURE REVIEW

2.1 Knowledge of LARC among HCWs

The knowledge of HCWs regarding LARC is paramount, considering their role as the main source of information for clients seeking contraception (Lasimbang *et al.*, 2018; Mastor *et al.*, 2011). During contraceptive discussions, clients often rely on HCWs for accurate and up-to-date information. They also might be hesitant to challenge HCWs' information due to the perceived expertise of these professionals (Tavrow, 2010). However, a qualitative study conducted among doctors and nurses in the United States, revealed that some HCWs acknowledged having outdated and lack of knowledge about LARC (Murphy *et al.*, 2016).

Healthcare workers should be well-versed in essential LARC information. A systematic review highlighted that the 'fit and forget' nature, high effectiveness and long-term protection were the top positive qualities of LARC perceived by women (Coombe *et al.*, 2016). Besides, research has shown that women opted for implants due to their long-lasting nature (96%), immediate reversibility upon removal (87%), and perceived effectiveness (76%) (Weisberg *et al.*, 2013). Therefore, possessing accurate knowledge about LARC effectiveness, duration of efficacy and its impact on fertility return is pivotal, as it can significantly influence clients' decisions. Furthermore, accurate information about the safety of implant for breastfeeding women can debunk misconceptions regarding potential harm to infants (Dev *et al.*, 2019), encouraging more breastfeeding women to consider this method.

Timely insertion and access to LARC can be improved by ensuring that HCWs are aware of updated guidelines. For example, the latest recommendation from the WHO (2022) allows IUCD to be inserted at any time during the clients' menstrual cycle. This is contrary to traditional practices where insertion was limited to menstruation. Besides, IUCD can be inserted at the time of caesarean section or within 48 hours of vaginal delivery (WHO, 2022). Data from six countries indicated that this practice is associated with minimal infection and perforation rates, with expulsion rates remaining below 3%, equivalent to interval IUCD (Makins *et al.*, 2018). This is an ideal opportunity to increase women's access to contraception, particularly considering the rising trend in deliveries in healthcare facilities (FIGO, 2020; Stone *et al.*, 2021).

However, like any modern contraceptive method, LARC is not without side effects or complications. Implant can cause changes in menstrual bleeding patterns, headache, abdominal pain, acne, mood changes and nausea (WHO, 2022). In a study conducted among Implanon users in Malaysia, irregular menstrual bleeding affected more than one-third of the participants, emerging as a major concern leading to discontinuation (Mastor *et al.*, 2011). This undesirable event not only impacted their sexual lives but also was deemed to hinder religious practices such as performing prayers or fasting.

On the other hand, the most common side effects of copper IUCD are heavier menses, prolonged menses and cramping pain, especially in the first few months of insertion. Complications associated with IUCD include rare occurrences of expulsion, malposition and perforation (Krishnamoorthy and Verma, 2017; WHO, 2022). In

Malaysia, fear of side effects stands as the second most common reason for non-users to avoid contraception, affecting 16.4% of the population (NPFDB, 2014). Addressing these concerns by informing clients about potential side effects is crucial, as it has been linked to higher client satisfaction and increased continuation rates (Dehlendorf *et al.*, 2014b).

The mean (SD) knowledge score regarding IUCD among doctors in Malaysia was 13.6 (2.8) out of 20 questions, which is equivalent to 68.0% (Chew *et al.*, 2018). Similarly, a study in Nepal by Chakraborty *et al.* (2015) found that the average overall knowledge score on IUCD among nurses in the public sector was 61.4% (21.5 out of 35 questions). In contrast, Canadian HCWs displayed a higher baseline knowledge score of 82.8% (Cook *et al.*, 2019). However, a direct comparison of the scores between these settings is challenging because the survey questions and target participants are different.

2.2 Attitude on LARC provision among HCWs

In the realm of human social interactions, attitudes represent the evaluations individuals make towards people, objects or ideas. Lawrence (2008) identified three components of attitudes: cognitive, which pertains to thoughts or beliefs about the attitude object; affective, which encompasses emotions or feelings towards the object; and behavioural, which involves actions and behaviours directed at the attitude object. The combination of these components forms an overall assessment of the attitude object. In this study, the attitude object under scrutiny is the LARC provision.

HCWs' attitudes towards LARC provision are shaped by their lack of accurate knowledge, personal experiences, core beliefs and cultural norms; influencing their willingness to engage in discussions about LARC with clients (Tavrow, 2010). They often create unnecessary barriers to contraceptive choice, either based on client-specific characteristics or the contraceptive method itself. Therefore, these attitudes can be categorised into client-related and method-related attitudes (Aziz and El-Gazzar, 2023; Dehlendorf *et al.*, 2014a; Solo and Festin, 2019).

Client-related attitudes manifest when HCWs impose unjustified restrictions on specific clients based on factors such as age, parity, or marital status, often beyond established guidelines. The Medical Eligibility Criteria (MEC) for contraceptive use by the WHO (2015) offers guidance on the safe and effective usage of specific methods like LARC for women with certain conditions. However, a study in Egypt revealed instances where HCWs discourage the use of IUCD among nulliparous women due to unfounded concerns about infertility or increased risks of intrauterine infections and ectopic pregnancies (Aziz and El-Gazzar, 2023). Similarly, in the United States, approximately one-fifth of HCWs refrained from recommending IUCDs to teenagers, nulliparous women or those with a history of ectopic pregnancy, contrary to the WHO recommendations (Biggs *et al.*, 2014). Such attitudes limit clients' access to diverse contraceptive choices, restricting their ability to make well-informed decisions. A study conducted by Kohn *et al.* (2012) among paediatricians and nurses in New York City showed that the mean score for the client selection domain was moderate at 63.3% (mean of 28.5 out of 45 total score).

Method-related attitudes, on the other hand, reflect preferences or aversions towards specific contraceptive methods, driven by inaccurate knowledge, perceived difficulty of administration or insufficient skills (Solo and Festin, 2019). Healthcare workers often exhibit a bias for or against certain methods, particularly LARC. They often hold less favourable attitudes towards IUCD compared to contraceptive injections due to the perception that IUCD insertion is difficult and requires a pelvic examination, making it a less preferred option among HCWs (Solo and Festin, 2019).

Additionally, HCWs may perceive LARC methods as requiring more time for counselling. A study highlighted that a significant portion of HCWs (61.0%) believed they needed more time to counsel about LARC compared to other contraceptive options, leading to reluctance in recommending LARC (Kohn *et al.*, 2012). A qualitative study using the “simulated client’s approach”, a method to observe spontaneous interactions between clients and HCWs, showed that HCWs were reluctant to offer LARC due to their lack of IUCD insertion skills, despite the clients’ preference for IUCD (Aziz and El-Gazzar, 2023). Furthermore, approximately one-third of doctors thought that the unavailability of LARC insertion service in their clinics or having inadequate LARC supply deter them from recommending the method to clients (Chew *et al.*, 2018). These negative beliefs regarding resources can severely limit the provision of LARC, impacting women’s reproductive choices.

2.3 Practice on LARC provision among HCWs

Counselling in the context of contraception has evolved with the increasing options available to individuals. The role of HCWs in counselling extends beyond mere information dissemination; it involves guiding patients to identify their preferences, ensuring that preferences are grounded by accurate information and producing a mutually acceptable decision (Dehlendorf *et al.*, 2014a). Poor communication not only results in client dissatisfaction but also leads to negative perceptions in the community regarding specific contraceptive methods, as clients may share their experiences and influence the community through word-of-mouth (Dehlendorf *et al.*, 2014a).

A frequently used method in contraceptive counselling is the ‘foreclosed approach’, where discussions focus on client-initiated contraceptive methods. However, this approach may result in missing the opportunity to educate clients about alternative contraceptive options, especially the lesser-known methods such as LARC (Schivone and Glish, 2017). Effective counselling should address key factors influencing method selection preferences such as effectiveness, side effects, duration of action, privacy and hormonal involvement (Dehlendorf *et al.*, 2014a). Unfortunately, HCWs often focused disproportionately on potential disadvantages compared to the benefits of LARC. Only 29.0% of HCWs mentioned IUCD’s effectiveness during counselling even though it is one of the prominent advantages of IUCD (Dehlendorf *et al.*, 2014b).