

**DEVELOPMENT OF A PRACTICE MODEL FOR
INDUCED LACTATION IN MALAYSIA**

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UNIVERSITI SAINS MALAYSIA

2021

**DEVELOPMENT OF A PRACTICE MODEL FOR
INDUCED LACTATION IN MALAYSIA**

By

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Thesis submitted in fulfilment of the requirements

for the degree of

Doctor of Philosophy

October 2021

ACKNOWLEDGEMENTS

Firstly, Alhamdulillah. Praise to Allah, the most compassionate and most merciful, whose blessing has helped me through the entire completion of this PhD thesis. Thank Allah for allowing me to embark on my PhD, help in all my endeavours to complete this long and challenging journey successfully. I would like to express my deepest gratitude and thank the following individuals who helped me throughout this research:

1. I would like to express my deepest appreciation and gratitude to my principal supervisor, Associate Professor Dr. Zaharah Sulaiman and co-supervisor Dr. Tengku Alina Tengku Ismail for the guidance, understanding, encouragement and invaluable help of constructive comments and suggestions throughout the whole research process and this thesis writing.
2. I also wish to express my sincere appreciation and thanks to my Field Supervisor Dr. Faridah Idris, for her persistent effort, expert advice, and support in my doctoral journey.
3. I would also like to acknowledge USM Short Term Grant (304/PPSP/61313098) for funding this research project. The Medical Research and Ethics Committee, Ministry of Health Malaysia with code NMRR-15-1600-26147 (IIR), and Human Research Ethics Committee University Sains Malaysia with Code Project USM/JEPeM/14044139 for granting permission to conduct this study.
4. Ministry of Health for their support and help towards my postgraduate affairs to ensure that I can complete my PhD.

5. My husband, Haji Amzari b. Haji Abu Bakar; my parents, Haji Che Abdul Rahim b. Haji Che Mahmood and Hajah Siti Hawa bt. Haji Mat Hussin; my mother-in-law, Hajah Maznah bt. Md Nor; my children, Sumayyah, Aliyatul Husna, Ammar Mursyid, Amir Asyraf and other family members, who gave their encouragement, continuous support and shoulders to lean on the hard times. They consistently encouraged me to persist, motivate and push me constantly all the way through. Without their endless love and understanding, I would not have been able to complete this journey successfully. This piece of victory is dedicated to all of you. Alhamdulillah.

6. Finally, I offer special thanks to those who had involved directly or indirectly for their assistance and continuous supports throughout the challenging period of my data collection process in this study. Many thanks for their cooperation and support throughout the study, your kindness means a lot to me. Thank you very much.

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LIST OF ABBREVIATIONS

BPC	Breastfeeding Peer Counsellor
CAM	Complementary Alternative Medicine
DVT	Deep Vein Thrombosis
EBM	Expressed Breast Milk
H	Hormonal
HG	Herbal Galactagogues
HRQOL	Health-Related Quality of Life
IBCLC	International Board-Certified Lactation Consultant
IM	Intramuscular
IUI	Intrauterine Insemination
IVF	In-Vitro Fertilization
KPWKM	The Ministry of Women, Family and Community Development
LC	Lactation Counsellor
MAKNA	Majlis Kanser Nasional
MD	Medical Doctor
MO	Medical Officer
NGO	Non-government Organization
NGPIL	Newman-Goldfarb Protocols for Induced Lactation
NLC	National Lactation Centre
NPFDB	National Population and Family Development Board
O&G	Obstetrics and Gynaecology
OCPs	Oral Contraceptive Pills
PCOS	Polycystic Ovary Syndrome

PIF	Prolactin Inhibitor Factor
PR	Public Relation
PTIL	Protocols to induce lactation
QOL	Quality of Life
S	Stimulation
SCT	Social Cognitive Theory
SNS	Supplementary Nursing System
SOP	Standard of Protocol
TRA	Theory of Reasoned Action
UN	United Nations
USM	Universiti Sains Malaysia
WHO	World Health Organization

PEMBANGUNAN MODEL AMALAN CETUSAN LAKTASI DI MALAYSIA

ABSTRAK

Cetusan laktasi adalah proses penghasilan susu ibu oleh wanita yang tidak pernah melalui proses kehamilan. Di Malaysia, kesedaran terhadap penyusuan anak angkat ini telah meningkat selari dengan pengambilan anak angkat. Oleh itu, kajian ini bertujuan untuk meneroka pengalaman pengamal laktasi, wanita yang pernah dan sedang melalui proses cetusan laktasi dan individu sokongan serta model amalan cetusan laktasi yang terdapat di Malaysia. Proses pengumpulan data telah dijalankan di lima buah negeri mewakili zon-zon di Malaysia [Selatan (Johor), Tengah (Selangor), Utara (Pulau Pinang), Timur (Kelantan), dan Malaysia Timur (Sabah)], bermula Disember 2015 hingga Jun 2017. Kajian kes pelbagai ini melibatkan tiga kaedah pengumpulan data iaitu temubual separuh berstruktur, soal selidik atas talian dan semakan dokumen. Dapatan kajian dibentuk berdasarkan ciri-ciri responden. Temubual dijalankan selepas mendapat persetujuan responden, kemudian dirakam dan disalin semula kata demi kata, dan seterusnya tema dikenalpasti. Ketepuan maklumat dicapai setelah berjaya menemubual 69 responden [pengamal laktasi (n=23); wanita yang melalui proses cetusan laktasi (n=23); dan individu sokongan (n=23)]. Maklumat temubual dikumpulkan dan disusun mengikut tema-tema tertentu. Data transkrip dianalisis menggunakan perisian *Atlas.ti* Versi 8.0 sementara data soal selidik dianalisis secara deskriptif menggunakan *Microsoft Excel*. Terdapat tiga tema yang terhasil daripada pengamal laktasi; (i) deskripsi pengamalan; (ii) pelan

penjagaan untuk klien; dan (iii) penjagaan berterusan yang berkualiti dan efektif untuk wanita, bagi memastikan proses cetus laktasi itu berjaya. Manakala, tiga tema yang diperolehi daripada pengalaman wanita yang melalui proses cetus laktasi adalah (i) faktor motivasi utama dalam proses cetus laktasi; (ii) cabaran proses cetus laktasi; dan (iii) faktor penyebab penyusuan anak angkat berjaya. Dua tema utama yang menunjukkan persepsi individu sokongan adalah (i) sikap positif terhadap proses cetus laktasi; dan (ii) menerima, mempelajari, dan melaksanakan peranan untuk menyokong. Soal selidik dalam talian yang diedarkan untuk individu sokongan (n=23) menunjukkan bahawa faktor utama yang memberikan motivasi kepada individu sokongan dalam cetus laktasi adalah “untuk mencapai status mahram (lima kali penyusuan)”. Dapatan ini adalah selaras dengan tema yang diperolehi daripada temubual yang dijalankan. Penyelidik turut mengumpulkan rekod program cetus laktasi di hospital, nota kes, bahan pengajaran, modul penyusuan susu ibu dan pekeliling-pekeliling kerajaan yang berkaitan. Berdasarkan dapatan kajian dan carian kesusasteraan ini, satu Model Amalan Cetus Laktasi telah dicadangkan untuk melihat amalan cetus laktasi di Malaysia. Model ini terdiri daripada tiga elemen utama yang melibatkan Polisi Kerajaan, Modal Insan dan Peralatan. Ketiga-tiga asas ini dipercayai saling berhubungkait dan mempengaruhi amalan cetus laktasi dalam kalangan pengamal perubatan, wanita, dan individu yang menyokong sama ada dari perspektif positif atau negatif. Model amalan ini memainkan peranan penting dalam memastikan pelaksanaan protokol yang selamat dan berkesan bagi meningkatkan kadar kejayaan dalam proses cetus laktasi di Malaysia.

DEVELOPMENT OF A PRACTICE MODEL FOR INDUCED LACTATION IN MALAYSIA

ABSTRACT

Induced lactation is a method of stimulating breast milk production in women who have not undergone pregnancy. In Malaysia, its awareness has progressively increased with the practice of adoption. Therefore, this study aimed to explore the experience of practitioners, women experiencing and undergoing induced lactation and their support persons, and Malaysia's practice model of induced lactation. Data collection took place in five states based on regions in Malaysia [South (Johor), Central (Selangor), North (Penang), East (Kelantan), and East Malaysia (Sabah)] from December 2015 to June 2017. Three approaches were used for this multiple case study, include semi-structured interviews, structured surveys, and document review. The results were presented and described according to the respondents' characteristics. Data saturation was achieved after interviewing a total of 69 respondents [practitioners (n=23); women (n=23); and support persons (n=23)]. The interviews were consented to, audio-recorded, and transcribed verbatim, followed by identification of emerging themes. The verbatim transcripts were managed using ATLAS.ti 8.0 software. Meanwhile, data from the questionnaires were stored in Microsoft Excel. A descriptive analysis was initially utilized. Three themes raised from practitioners were (i) description of practice; (ii) care plans for clients; and (iii) quality and effective continuity of care for the women, which correlate to a successfully induced lactation. Data analysis also revealed three themes related to

women's decision to induce lactation included (i) main motivation factors for undergoing the induced lactation process; (ii) the key challenges for women during the process of induced lactation; and (iii) the factors affecting successful adoptive breastfeeding. The support person's perception of induced lactation indicates two themes (i) a positive attitude towards the induced lactation process; and (ii) accepting, learning, and implementing the support role. The online survey distributed for support persons (n=23) showed that the main factors that motivated them was "to achieve *mahram* status (five times feeding)". This result was congruent with the thematic analysis. The researcher gathered a record of induced lactation programs in hospitals, case notes, instructional material, breastfeeding modules and related government circulars. Based on study findings and literature searches, a Practice Model of Induced Lactation was recommended to predict the outcome of induced lactation practice in Malaysia. Three basic foundations make up this model are Government Policy, Human Capital, and Equipment. These three foundations are necessary foundations that are believed to be related to each other and influence the induced lactation practice among practitioners, women, and support persons either from a positive or negative perspective. This practice model plays an important role in ensuring the safe and effective implementation of the induced lactation protocol in order to increase the rate of breastfeeding success rate in Malaysia.

CHAPTER 1

INTRODUCTION

1.1 Introduction

In this chapter, the research context, problem statements, and significance of the study are explained in depth. The research questions, research objectives, and operational definitions are listed accordingly.

1.2 Background of the study

Induced lactation is a method of stimulating breast milk production in women who have not undergone pregnancy (Szucs *et al.*, 2010). Induced lactation is not a new concept but instead is well documented in history and many cultures. Today, the interest in induced lactation stems from some adoptive mothers' desire to nurture their adopted child from the breast even though they could not carry the fetus in the womb.

Practically, women who had never conceived and did not give birth can produce breast milk. According to Zaharah and Tengku Alina (2011), the categories of women who can undergo induced lactation are as follows: (i) women who have no ovaries or egg factory; (ii) women who have no uterus; (iii) non-pregnant women or women who have never given birth; (iv) women who have reached menopause; (v) pregnant women who experience a miscarriage; and (vi) women with stillborn babies or babies who die shortly after birth. The induced lactation process is different from

galactorrhea or inappropriate lactation, which has been described in the medical literature for more than 100 years (Vorherr, 1974).

Among the reasons for encouraging nursing through the method of induced lactation are: to save the lives of babies whose mothers die soon after their birth (Chaturvedi and Dubey, 1985; Nemba, 1994; Abejide *et al.*, 1997); to build a strong bond between mothers and the children to whom they did not give birth (Gribble, 2007); to meet the nutritional needs for breast milk in the case of babies carried by surrogate mothers (Auerbach and Avery, 1981; Kinga *et al.*, 2010); and, in Islam, to create a restriction against marriage between adoptive siblings who were nursed by the same mother (Zilal and Farahwahida, 2014).

An adoptive mother and her adopted child are considered to have developed a *mahram* relationship at least five times after the mother breastfed the child before the child reaches the age of two (i.e., provides them with a complete meal of breast milk). In Islam, the adoptive mother is not considered to have any familial bond with her adopted child until she feeds them with her own breast milk. Therefore, the Fatwa Committee of the National Fatwa Council for Islamic Religious Affairs in Malaysia recommends that a Muslim adoptive mother feed her adopted child with her breast milk to make that child a full member of her family (Islamic Development Department of Malaysia, 2011). Induced lactation is becoming more common in Malaysia. Awareness about nursing an adopted child has progressively increased with the practice of adoption. Table 1.1 shows the number of applications for registration and adoption of children from 2010 to 2018.

Table 1.1: Application for registration of adoption in Malaysia (2010 to 2018)

States	Year								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Johor	42	46	54	59	12	47	184	125	92
Kedah	9	107	150	159	130	140	175	99	66
Kelantan	66	9	43	105	39	141	56	15	60
Melaka	171	138	159	160	160	138	145	119	142
Negeri Sembilan	98	100	135	134	14	92	194	115	136
Pahang	47	55	85	81	55	73	101	80	66
Perak	59	70	253	172	118	216	236	182	63
Perlis	0	0	0	26	0	0	24	0	7
Penang	0	0	21	106	94	125	82	143	132
Sabah	0	0	0	0	0	0	34	3	13
Sarawak	0	0	76	0	0	0	0	0	0
Selangor	907	852	870	899	600	744	936	1033	519
Terengganu	43	52	29	40	40	12	5	5	11
WP Kuala Lumpur	9	268	266	293	146	190	153	100	88
WP Labuan	0	0	0	0	0	9	29	28	26
WP Putrajaya	0	0	0	0	0	0	0	3	3
Total	1451	1697	2141	2234	1408	1927	2354	2050	1424

[Source: The National Registration Department of Malaysia and application for legal adoption through The Courts, (2010; 2011; 2012; 2013; 2014; 2015; 2016; 2017; and 2018)]

The increase in adoption is attributed to couples' inability to produce their own offspring, thus encouraging them to consider adoption. According to the United

Nations (UN), statistics from 2010 to 2015 show that couples' fertility rates in Malaysia declined to 1.97 children per household. It is predicted that this figure will fall to 1.90 children per household in 2020 and continue to fall to 1.72 by 2050. This increased incidence of infertility in Malaysia indicates that one in six couples were infertile by 2050 (United Nations, 2013). According to the Fifth Malaysian Population and Family Survey, which was conducted in 2014, on average, the number of children born to each woman aged 20-24 years is 1.1; to each woman aged 25-29 years is 1.5; to each woman aged 30-34 years is 2.3; to each woman aged 35-39 years is 3.1; to each woman aged 40-44 years is 3.5; and to each woman aged 45-49 years is 3.8. Less children are more likely to be born to the youth of today (National Population and Family Development Board (NPFDB), 2016).

Figure 1.1 also demonstrates the rapid decline in fertility rates in Malaysia, and it is expected that the rate will reach the replacement level (replacement level = 2.1) by 2015 (Adzmel *et al.*, 2012).

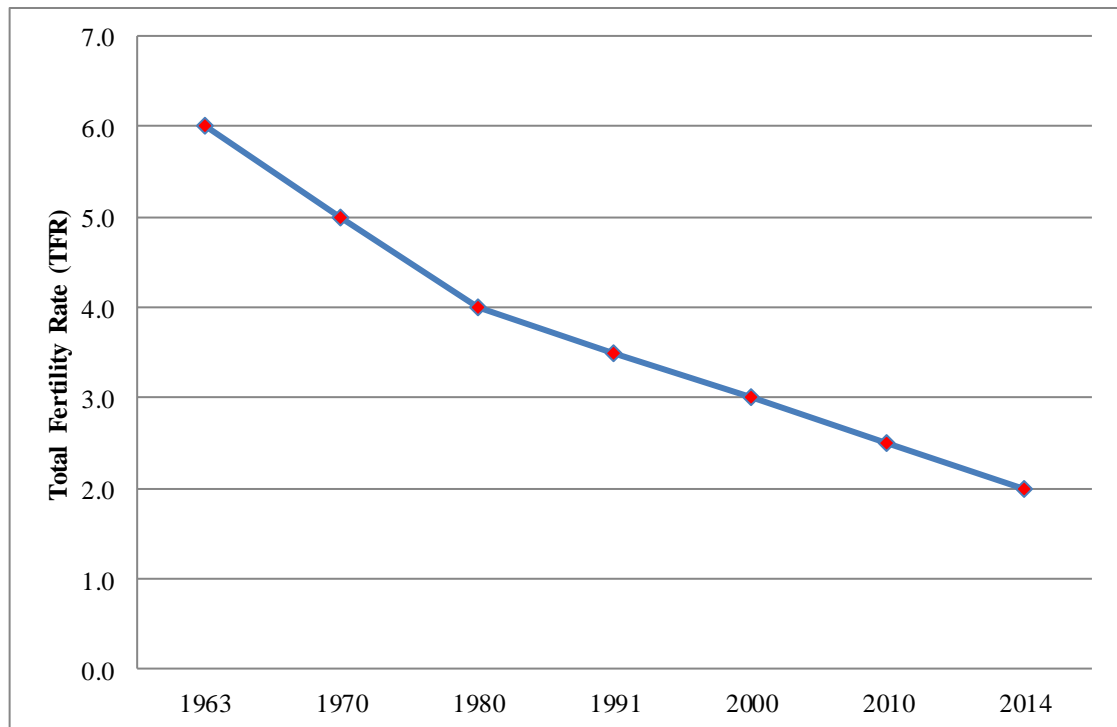


Figure 1.1: Fertility rates in Malaysia (Source: Adzmel *et al.* 2012)

According to the latest figures released by the Department of Statistics (2020), Malaysia's fertility rate is continuing to decline. It is at 1.8 babies per woman, well below the replacement level of 2.1 babies. In 2017, the rate was 1.9 babies per woman aged between 15 and 49. A replacement level of 2.1 babies will ensure that a woman will produce enough infants to replace herself and her partner during her reproductive period. There was a 1.3% drop in the number of live births recorded, from 508,685 live births in 2017 to 501,945 in 2018.

Although the fertility rate of women is declining, women's desire to have children remains high. Research conducted by Adzmel *et al.* (2012) among women in the reproductive age group 15 to 49 years old and working in public and private sectors in Kuala Lumpur, Selangor, and Putrajaya proved that as many as 75.9% of the 1,898 respondents had the desire to give birth. In view of this, women's inability to give

birth in Malaysia had caused married couples to pursue adoption. Adoptive breastfeeding is not rare in developing countries (Dalzell, 2010). The main purpose of adoptive breastfeeding is to establish a mother-child relationship between a mother and an infant, not her biological child (Auerbach and Avery, 1981). Although women who adopt may not breastfeed their babies exclusively, they can still breastfeed if given good support. However, some women do exclusively breastfeed their adopted children (Newman and Pitman, 2006).

The induced lactation process needs great dedication and determination. According to the many who have attempted it, it is far more arduous a task than initiating postpartum lactation, but it is possible and worth the effort. The situation is better managed when a lactation practitioner is available. It is appropriate for a physician to suggest that the mother seeks counseling from a certified lactation consultant experienced in induced lactation in addition to medical support. Continuous follow up for verbal support may be helpful.

Induced lactation is a special event that requires medical personnel's positive support (Waterston, 1995). The mother who chooses to induce lactation will need more support and encouragement than women who experience natural postpartum lactation. Her partner/spouse, family member, health clinicians, and mother support group are a platform for mothers to get support and share their experiences in adoptive breastfeeding. Hence, during induced lactation procedures, they may serve as a valuable support device. Emotional and psychological factors may affect the secretion of oxytocin. Self-confidence and a deep desire to be good are also essential factors for success.

1.3 Statement of the problem

Induced lactation and adoptive breastfeeding are not new concepts. The practice of inducing lactation has still been practiced today, according to older studies, case reports, various websites, and a small number of publications (Auerbach,1981; Auerbach and Avery, 1981; Thearle and Weissenberger, 1984; Ryba and Ryba,1984; Nemba, 1994; Cheales-Siebenaler, 1999; Biervliet et al., 2001; Kirkman and Kirkman, 2001; Bryant, 2006; Balogun *et al.*, 2017; Flores-Antón *et al.*, 2017; Zingler *et al.*, 2017; Cazorla-Ortiz *et al.*, 2019).

The major problems to be addressed in this study are obtaining a comprehensive overview of the process that adoptive mothers and support persons undergo to induce lactation and document the wide variations in induced lactation practices between Malaysian lactation practitioners' subgroups of the population in Malaysia. In order to create a blueprint for induced lactation that Malaysian couple and medical professionals will adopt in the years to come, these procedures and protocols should be scientifically recorded. This practice model may improve the rate of success and ensure the safe implementation of induced lactation protocol for Malaysian women. No national data for induced lactation is available to date. However, most hospitals and health clinics in Malaysia have provided induced lactation services to their clients in their respective places. Nonetheless, with the rising awareness of and demand for adoptive breastfeeding, practitioners in Malaysia have been treating adoptive women who intend to become nursing mothers accordingly and depending on each other's situation.

Prior to the 1970s, reports of induced lactation in the United States and Europe concerned adoptive mothers who had put their infants to their breast for comfort (Cohen, 1971; Hormann, 1977; Auerbach and Avery, 1981). From the 1980s onward, researchers began to investigate the methods, procedures, medications, and herbs used to treat mothers with reported or perceived low-milk supply and to apply those methods to adoptive breastfeeding and then report their experiences (Anderson, 1986; Gershon, 1997; Goldfarb, 2002).

As a result of the advent of information available through the Internet, there are now many protocols and/or procedures that women can follow to induce lactation or start adoptive breastfeeding. This information can be easily spread worldwide. Induced lactation protocols and procedures available on the Internet have been tried, observed, and noted informally by women, and then subsequently reported anecdotally (e.g., see Kellymom.com, AskLenore.info, fourfriends.com, Lalecheleague.org, babiestoday.com).

Most of the induced lactation and adoption information available in Malaysia is from individual bloggers, family magazines, Malaysian government Islamic department websites, and online news. In the meantime, little information is available from local journals. Despite its purported benefits, induced lactation, although widely discussed on social media, has not been studied in-depth by researchers in Malaysia. This opportunity allows the researcher to explore more deeply induced lactation practices from various angles; this can benefit Malaysia's community.

Figure 1.2 shows statistics for induced lactation consultation from 2009 to 2018 and demonstrates the trend of women seeking advice on induced lactation from Malaysia's National Lactation Centre (NLC). The NLC practitioners stated that some adoptive mothers were effectively inducing lactation while others were not successful in inducing lactation (National Lactation Centre, 2018). Many practitioners and adoptive parents do not have standardized information on procedures and protocols for induced lactation. Developing such guidelines is very important, and it is especially urgent in Malaysia, given the recent expansion in Malaysian awareness of adopted breastfeeding children.

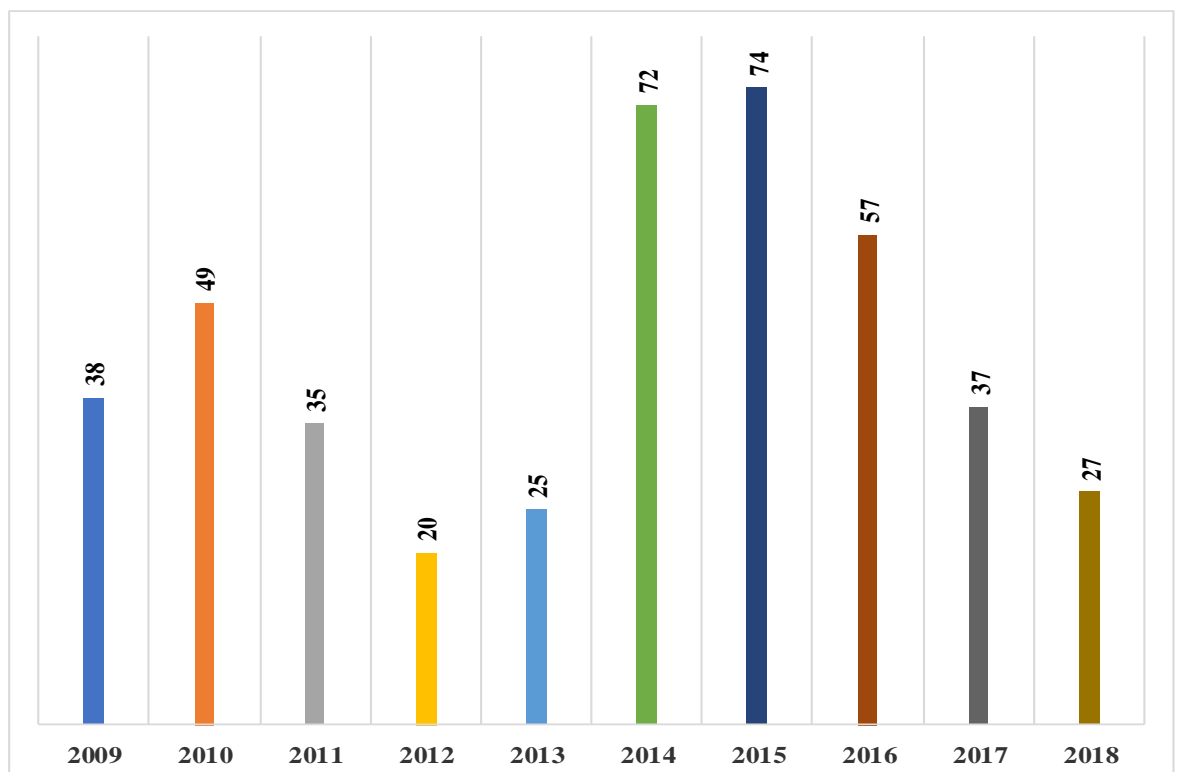


Figure 1.2: Number of consultations about induced lactation at the National Lactation Centre (2009 to 2018) (Source: National Lactation Centre, Ministry of Health Malaysia Report, 2018)

1.4 Significance of the study

This study provides a recommended practice model that can be disseminated to all relevant parties. This model provides a step-by-step approach to induced lactation protocol and breastfeeding techniques and explains the importance of managing the adoptive mothers' behavior along the process. The model could become a potentially useful professional development module and guideline for researchers and health professionals in Malaysia. It can also be used to deliver the appropriate terminology to use when discussing induced lactation, thus facilitating practitioners, managers, policymakers, and researchers.

This study's findings could also apprehend maternal views related to mothers' needs, obstacles, experiences, perceptions, and motivations. By behaving like normative, gestational mothers such as breastfeeding, simulating "good mother" expectations will reassure the adoptive mother and be a pronouncement that they are no different. But more is going on, and it has to do with the notion that adoptive children start life with a discrepancy. Given the recent developments in medical technology and the dire need among Malaysians, evidence-based, accurate, and reliable information on induced lactation must be made available to professionals and other individuals in this country. Due to the limited availability of similar local studies, this study is timely in its generation of new knowledge on the practice of induced lactation amidst rapid technological enhancements and changing societal needs.

Finally, this study's contents and findings will provide reference material for both policymakers and those in positions of influence and power. It will guide them in making decisions and policy pronouncements that will exceptionally be of interest to

government planning authorities and population agencies, as well as non-governmental organizations interested in breastfeeding. The researcher is confident that this induced lactation practice model will be an excellent resource for health-care personnel, academicians, non-governmental organizations, and other stakeholders in the future.

This practice model serves as the primary source of reference for servicing the area of breastfeeding and infant nutrition development not only in Malaysia but also elsewhere. Every viable step should be taken to upgrade the existing system and fix any imperfection in Malaysia's induced lactation practice. The Ministry of Health of Malaysia needs to review current policy to improve and adjust to support adoptive mothers who will breastfeed their babies through the induced lactation process.

1.5 Research questions

The research questions of this study are as follows:

- i. How does treating practitioners' practice induced lactation in Malaysia?
- ii. What are the experiences of women regarding induced lactation in Malaysia?
- iii. What are the perceptions of support persons regarding induced lactation in Malaysia?
- iv. What is the suggested practice model for induced lactation in Malaysia?

1.6 Objectives of the study

1.6.1 General objective

The general objective of this study is to explore the experience of practitioners, women, and support persons, and develop a practice model of induced lactation in Malaysia.

1.6.2 Specific objectives

The specific objectives of this study are as follows:

- i. To identify and document the practice of practitioners on induced lactation in Malaysia.
- ii. To explore the experience of women undergoing the induced lactation process in Malaysia.
- iii. To explore the perception of a support person regarding induced lactation in Malaysia.
- iv. To develop a practice model of induced lactation in Malaysia.

1.7 Definition of terms

The following terms are used in this study:

- i. Adoptive mother: a woman who becomes a mother to an adopted infant.
- ii. Adoptive breastfeeding: a mother who breastfeeds an adopted infant without getting pregnant. It also refers to a process by which a woman who was not pregnant produces breast milk for her baby.
- iii. Adopted baby: a baby born to one mother and raised by an adoptive mother.
- iv. Biological mother: a woman who is biologically related to her offspring and who may or may not have birthed that offspring.
- v. IBCLC (International Board-Certified Lactation Consultant): a health professional who specializes in the clinical management of breastfeeding.
- vi. The support system: a network of people who provide an individual with practical or emotional support.
- vii. Galactagogue: medication or herbal substance that causes or augments mammals' milk production.
- viii. Induced lactation: the process by which milk or breast milk is produced in a mammal (woman) without the benefit of recent pregnancy and/or birth. This process may include herbs, supplements, medications, mechanical/manual stimulation, and/or the offspring or infant to bring in the milk or breast milk supply.
- ix. Procedure for inducing lactation: a series of steps undertaken with the intent to cause the production of breast milk in women (may or may not include

medications, herbs, pumping, and/or supplementary feeding tube at the breast).

- x. In-vitro fertilization: a complex series of procedures used to help with fertility or prevent genetic problems and assist with the conception of a child (Eichenberg, 2020).
- xi. Intrauterine insemination (IUI): is a fertility treatment that involves placing sperm inside a woman's uterus to facilitate fertilization. The goal of IUI is to increase the number of sperm that reach the fallopian tubes and subsequently increase the chance of fertilization (Papillon-Smith *et al.*, 2015).
- xii. Wet nursing: breastfeeding a child who is not one's own.
- xiii. *Mahram*: one to whom marriage is absolutely and permanently prohibited.
- xiv. *Awrah*: body parts that must be covered from others.

A practitioner is a person engaged in breastfeeding practice, as described in Table 1.2.

Table 1.2: Definition of the practitioner in this study

Category of practitioner	Definition	Source
International Board-Certified Lactation Consultants (IBCLCs) also known as Lactation Consultants	<ul style="list-style-type: none"> <li data-bbox="671 539 1222 1088">• An International Board-Certified Lactation Consultant (IBCLC) specializes in the clinical management of breastfeeding as a health care provider. IBCLCs are accredited under the supervision of the US National Commission for Certifying Organizations by the International Board of Lactation Consultant Examiners, Inc. <li data-bbox="671 1122 1222 1659">• IBCLCs work in various healthcare settings, including hospitals, pediatric offices, public health clinics, and private practices. In Malaysia, lactation consultants are often medical doctors, nutritionists, nurses, physicians, and experienced volunteer breastfeeding counselors who have obtained additional IBCLC certification. 	Chetwynd <i>et al.</i> (2019)

“Table 1.2-Continued”

Category of practitioner	Definition	Source
Medical Doctor (MD)	<ul style="list-style-type: none"> • Medical doctors can specialize in health, such as dermatology, neurology, gastroenterology, or gynecology. • For breastfeeding management, usually, the MD working at a gynecology unit or mother and child health clinic. 	Ministry of Health Malaysia (2016)
Lactation Counselor (LC)	<ul style="list-style-type: none"> • A lactation counselor has taken a 20-hour lactation education course and a 40-hour counseling course in breastfeeding management training (a training course for health professionals). • Their primary role is to educate families interested in learning more about breastfeeding. • An LC does not offer medical assessment or advice (except for LCs who are also medical doctors) but instead refers families to local resources if a problem arises. • They consist of medical doctors, nutritionists, and nurses. 	Ministry of Health Malaysia (2020)

“Table 1.2-Continued”

Category of practitioner	Definition	Source
Breastfeeding peer counselor (BPC)	<ul style="list-style-type: none"> • A BPC is someone who offers mother-to-mother support for breastfeeding, advocates for breastfeeding as the standard, optimal way of feeding an infant, and helps to establish or prolong the time spent breastfeeding. • Peer counselors are accredited by various agencies (examples: National Lactation Centre, susuibu.com, and Malaysian Breastfeeding Peer Counselor Association) and have varying qualifications. • Most have completed around 20 hours of training and taken some examination. 	Malaysian Breastfeeding Peer Counselor Association (2018)

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter focuses on identifying and reviewing the key research areas pertaining to this study through a comprehensive literature search and synthesis. The review was undertaken to inform this study's research questions.

Accordingly, this chapter is structured as follows: (1) Introduction; (2) Induced lactation; (3) Induced lactation procedure; (4) Overview on induced lactation practices in Malaysia; (5) The role of social support in the induced lactation process; (6) Theoretical framework; and (7) Conceptual framework.

2.2 Induced lactation Process

The term induced lactation is defined for this study as the process by which breast milk is produced in a mammal (woman) without recent pregnancy and/or birth, and may include the use of herbs, supplements, medications, mechanical/manual stimulation, and/or the offspring or infant, to bring in the breast milk supply (Goldfarb, 2009). The biology of induced lactation is that it is not necessary to have been pregnant in order to breastfeed (Newman and Goldfarb, 2002; Newman and Goldfarb, 2007). During pregnancy, a human mother's body produces increasing amounts of the hormone's progesterone and estrogen via the placenta, and prolactin

via the pituitary gland. These hormones ready the breasts for breastfeeding (Riordan, 2005).

Once the pregnancy is completed, progesterone and estrogen levels drop considerably, prolactin rises, and the process of lactation commences (Riordan, 2005). Hence, a woman whose pregnancy ends any time after 16 weeks of gestation may proceed to lactate (Riordan, 2005). Breast milk will be produced whether the mother breastfeeds or not because this stage of lactation is under endocrine (hormonal) control. Within a few days, endocrine control gives way to autocrine control, and the continuation of lactation is dependent on local control at the breast level, based on supply and demand (Prentice *et al.*, 1986).

2.2.1 Phases of induced lactation

Researchers from previous studies have stated that there are three phases involved in induced lactation (Emery, 1996; Gabay, 2002; da Silva and Knoppert, 2004; Campbell-Yeo *et al.*, 2006; West and Marasco, 2009; Zuppa *et al.*, 2010; Fife *et al.*, 2011). For clarification, the researchers demonstrate the replication phases that are performed during the induced lactation period in Figure 2.1. Women undergoing induced lactation do not undergo any physiological changes during pregnancy, and their breasts do not undergo the phases of mammogenesis (milk gland development phase), lactogenesis (milk production phase), and galactopoiesis (the phase to ensure that milk production is maintained). Before beginning the process of lactation, women need to understand the physiology of lactation.

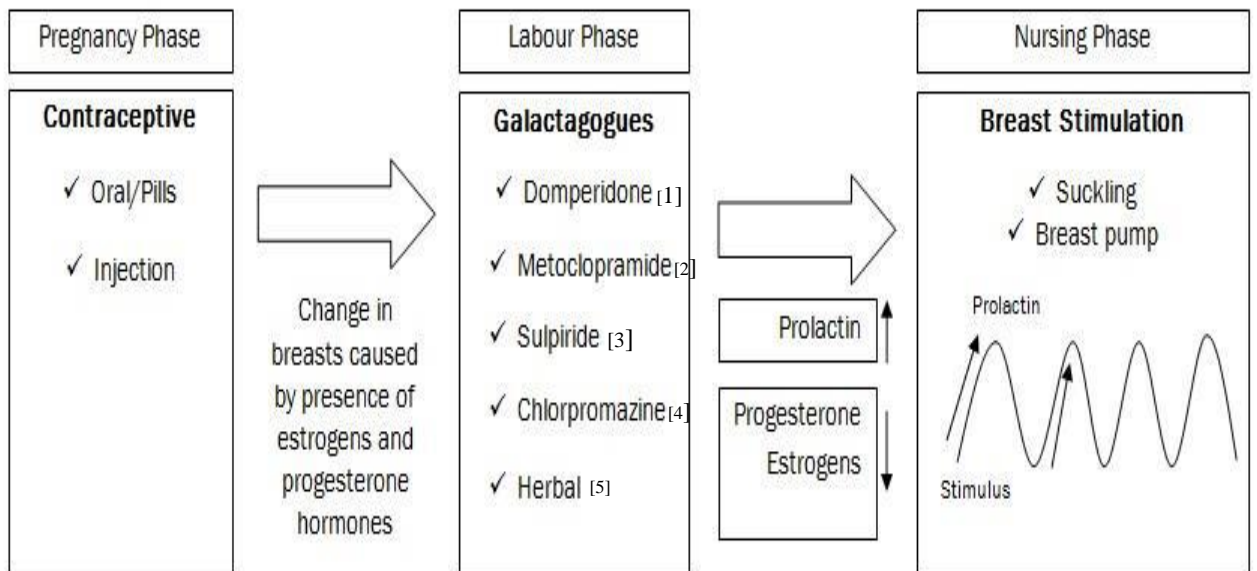
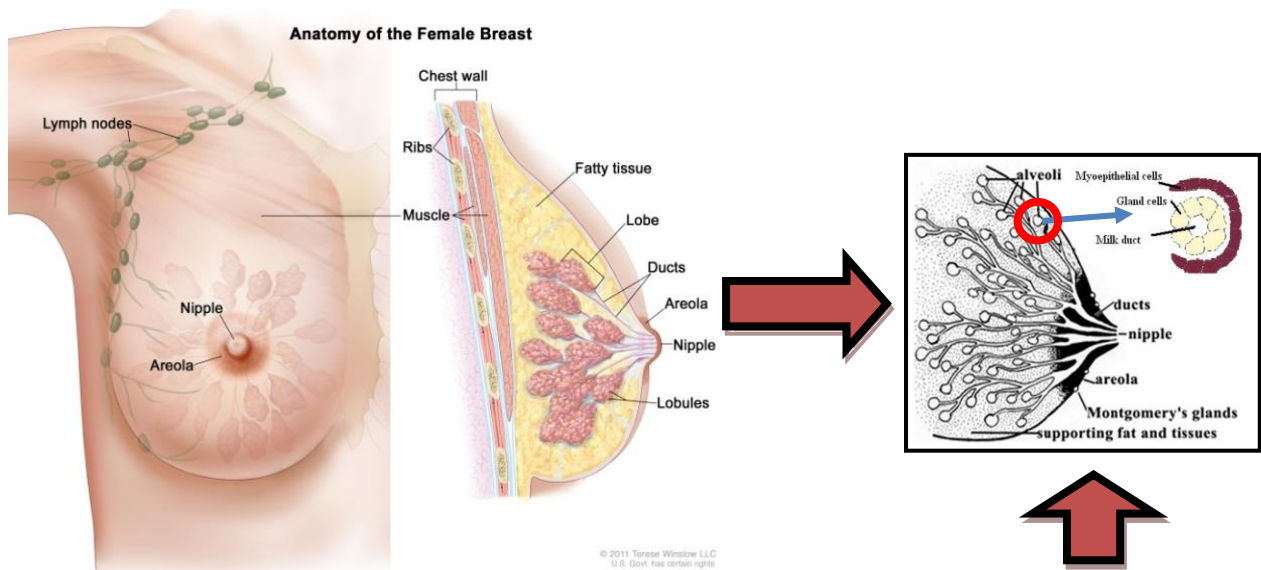


Figure 2.1: Phases of induced lactation (Source: Zilal and Farahwahida, 2014)

[1] Campbell-Yeo *et al.*, 2006; da Silva and Knoppert, 2004; Zuppa *et al.*, 2010; [2] Emery, 1996; Fife *et al.*, 2011; Gabay, 2002; [3] [4] Emery, 1996; Gabay, 2002; [5] West and Marasco, 2009

2.2.1(a) Pregnancy phase

During pregnancy, a woman's breasts will undergo significant changes due to the presence of hormones such as estrogen, progesterone, prolactin, and other hormones (Figure 2.2). These hormones work to make the ductular sprouting branches ready to produce breast milk. At this point, a woman will feel the change in the size and weight of the breast (Biervliet *et al.*, 2001).



Little sacs of milk-producing cells or alveoli that produce milk:

- Surrounding each alveolus are little muscles that contract to squeeze the milk out into the ducts.
- There is also a network of blood vessels around the alveolus that brings the nutrients to the cells to make milk.

Figure 2.2: Anatomy of the female breast (Source: Winslow, 2011)

Some medications can mimic the hormones present during pregnancy. For instance, oral contraceptives taken in conjunction with prolactin stimulating medications can provide progesterone and estrogen. These medications can stimulate breast growth, thereby facilitating lactogenesis (Newman and Goldfarb, 2002; Newman and Goldfarb, 2007). However, shortly after birth, these hormones decrease dramatically, allowing the prolactin and oxytocin hormones to function optimally (Shaikh Alaudeen, 1996). The prolactin hormone is responsible for the formation and production of milk, while the oxytocin hormone plays a role in ejecting breast milk from the areola and breast. This action is called the oxytocin reflex, otherwise known as the let-down reflex (Faridah, 2013).

2.2.1(b) Labor phase

The labor phase is commenced after the mother feels a change in the breast. The adoptive mother can stop taking the contraceptive pill before initiating breast stimulation (Bryant, 2006). Significant improvements in the breast include an increase in the size of the breast and full, heavy, and painful breasts (Newman and Pitman, 2006). In the case of induction of lactation, the adoptive mother should take one of the dopamine antagonists, galactagogues, the presence of which can increase the prolactin levels in the mother's body (Shaikh Alaudeen, 1996). Galactagogues are often used by women who want to breastfeed their baby but cannot produce enough milk or produce no milk at all (Emery, 1996). Metoclopramide and domperidone are two of the most used drugs as galactagogues. Some women reported they did not have to rely on taking galactagogues during breastfeeding, but other women needed help during the process of feeding and used galactagogues (Bryant, 2006). Some herbs, such as fenugreek and blessed thistle, are also used as galactagogues (Bryant, 2006).

2.2.1(c) Nursing phase

After mimicking the labor phase, the nursing phase can begin. However, the hormone prolactin needs to be established in order for the adoptive mother to produce breast milk. In normal breastfeeding conditions, the secretion of the prolactin hormone is regulated by the prolactin inhibitor factor (PIF), and catecholamines regulate PIF in the hypothalamus. However, some drugs can inhibit catecholamines from reducing PIF further and increasing prolactin levels. In this

case, dopamine antagonists or drugs that block dopamine receptors can increase breast milk production.

The needs of the baby regulate the supply of milk. The more breast milk that is withdrawn from the breast, the more milk the breasts will produce (Cox *et al.*, 1999). A neuron-hormonal signal is sent to the pituitary gland from the nipple-areola area of the breast as the baby breastfeeds, or the mother starts to express it. The signal causes the anterior pituitary to release prolactin for milk synthesis and, subsequently, the posterior pituitary to release oxytocin for milk ejection (Riordan, 2005) (Figure 2.3). It is due to the hormonal and local control of lactation that women are able to lactate.

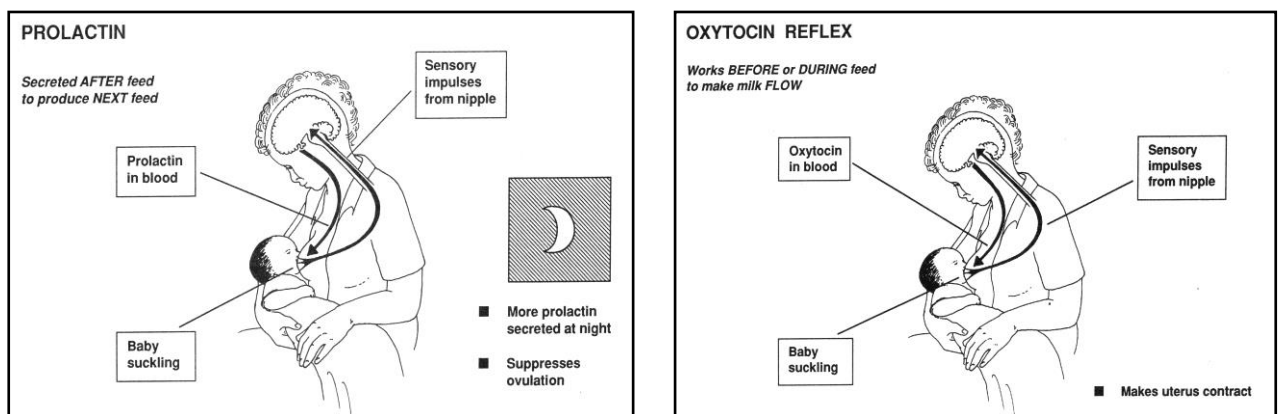


Figure 2.3: Breast milk production (Source: WHO, 2013)

As mentioned, nipple stimulation causes a rise in prolactin (Tyson *et al.*, 1972), which in turn tells the breast to synthesize milk. An infant's suckling can, therefore, produce breast milk supply without the mother having been pregnant (Abejide *et al.*, 1997). When the breast milk of a mother who has induced lactation was compared to that of a birth mother, little difference was found (Kulski *et al.*, 1981).

2.2.2 Methods of induced lactation

Methods commonly used to induce lactation include, often in combination, pharmacological (hormonal stimulation) and non-pharmacological (breast stimulation) methods.

2.2.2(a) Pharmacological method

The pharmacological method involved in the pregnancy and labor phases (refer Figure 2.1). The pharmacologic method includes medication, contraceptives and galactagogues (medicines that aid in initiating and maintaining adequate milk production) (Cazorla-Ortiz *et al.*, 2019). Contraceptives are used to mimic the pregnancy stage in which elevated estrogen and progesterone levels occur (Wittig and Spatz, 2008). After changes are felt in the breasts, such as tightening and swelling, the contraceptive intake will be stopped and replaced with galactagogues to stimulate the release of the prolactin hormone. Some pharmacological therapies have been shown to be more successful than others, and several have important side effects that need to be fully understood and taken into consideration before selecting a pharmacological regimen. These pharmacological methods may be used alone, but in combination with nipple stimulation strategies, they are most effectively used (Sabatini and Cagiano, 2006; Forinash *et al.*, 2012).

2.2.2(a)(i) Contraceptives

Over the years, many drugs, herbs, and folk remedies have been used to either induce lactation or increase the amount of milk production. Numerous case reports exist in which women have used various exogenous hormones to mimic pregnancy and