

**MATERNAL BEHAVIOURS AND CONSIDERATIONS OF
BREASTFEEDING PRACTICES IN MALAYSIA DURING THE
COVID-19 PANDEMIC**

By

CHING XIN NI

A project report submitted to the Department of Biomedical Science
Faculty of Science
Universiti Tunku Abdul Rahman
in partial fulfilment of the requirements for the degree of
Bachelor of Science (Hons) Biomedical Science

May 2022

ABSTRACT

MATERNAL BEHAVIOURS AND CONSIDERATIONS OF BREASTFEEDING PRACTICES IN MALAYSIA DURING THE COVID-19 PANDEMIC

Ching Xin Ni

Breast milk is an ideal food for infants to ensure their survival and immediate health. Since the COVID-19 outbreak in the late 2019, a few studies regarding the impacts of lockdown during the COVID-19 pandemic on breastfeeding have been reported. Various findings have been documented in different countries. However, none of this study has been done in Malaysia. Therefore, a cross-sectional study was performed in this study among Malaysian mothers with children aged less than two years old ($n = 107$) during COVID-19 pandemic. This was to explore the association of infant feeding practices and changes with the periods of delivery. Additionally, this study was aimed to investigate the association between changes in breastfeeding practices and three aspects which included maternal demographic characteristics, perceived effects of COVID-19 lockdown and perception towards possible reasons of changing breastfeeding practices. In this study, the actual breastfeeding practices for the first six months of babies had moderately changed (17.8%) from the mothers' initial feeding intention before giving birth, in which the rate of exclusive breastfeeding was slightly decreased (4.6%) while the partial breastfeeding was moderately increased (12.1%) from the initial breastfeeding intention. The Fisher's exact

tests indicated a significant association between the feeding intention before delivery and periods of delivery ($p = 0.002$). Significant associations between changes of breastfeeding practices and four aspects such as maternal educational level ($p = 0.007$), total number of children ($p = 0.026$), perception of insufficient milk ($p = 0.047$) and embarrassment ($p = 0.047$). However, no association was found between any of the perceived effects of COVID-19 lockdown and changes of breastfeeding practices ($p > 0.05$). In conclusion, the breastfeeding-promoting interventions should be focused on the aspects that are significantly associated with the changes in breastfeeding practices as observed in this study.

ACKNOWLEDGEMENT

First and foremost, I would like to thank Universiti Tunku Abdul Rahman (UTAR) for approving this final year project. I would also like to express my greatest thanks to my supervisor, Dr. Michelle Ng Yeen Tan, who has successfully guided me through this project using her wide expertise and knowledge. Besides, credit also goes to Ms. Kokila A/P Thiagarajah, for her patience and guidance throughout the statistical analysis process.

Next, I would like to take this opportunity to all my seniors and friends for their assistance and encouragement throughout this project. Last but not least, I would like to express my appreciation to all the respondents who participated in this study. Their cooperation was the key to the success of my study.

DECLARATION

I hereby declare that this final year project report is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.



CHING XIN NI

APPROVAL SHEET

This project report entitled “**MATERNAL BEHAVIOURS AND CONSIDERATIONS OF BREASTFEEDING PRACTICES IN MALAYSIA DURING THE COVID-19 PANDEMIC**” was prepared by CHING XIN NI and submitted as partial fulfilment of the requirements for the degree of Bachelor of Science (Hons) Biomedical Science at Universiti Tunku Abdul Rahman.

Approved by:



(Dr. Michelle Ng Yeen Tan)

Date: 21st April 2022

Supervisor

Department of Allied Health Sciences

Faculty of Science

Universiti Tunku Abdul Rahman

FACULTY OF SCIENCE
UNIVERSITI TUNKU ABDUL RAHMAN

Date: 21st April 2022

PERMISSION SHEET

It is hereby certified that **CHING XIN NI** (ID No: **19ADB06955**) has completed this final year project report entitled “**MATERNAL BEHAVIOURS AND CONSIDERATIONS OF BREASTFEEDING PRACTICES IN MALAYSIA DURING THE COVID-19 PANDEMIC**” under the supervision of Dr. Michelle Ng Yeen Tan and Ms. Kokila A/P Thiagarajah from the Department of Allied Health Sciences, Faculty of Science.

I hereby give permission to the University to upload the softcopy of my final year project report in pdf format into the UTAR Institutional Repository, which may be made accessible to the UTAR community and public.

Yours truly,



(CHING XIN NI)

TABLE OF CONTENTS

	Page
ABSTRACT	ii
ACKNOWLEDGEMENT	iv
DECLARATION	v
APPROVAL SHEET	vi
PERMISSION SHEET	vii
TABLE OF CONTENTS	vii
LIST OF TABLES	xi
LIST OF FIGURES	xii
LIST OF ABBREVIATIONS	xiii
CHAPTER	
1.0 INTRODUCTION	1
2.0 LITERATURE REVIEW	5
2.1 Breastfeeding	5
2.1.1 Composition of Human Breast Milk	5
2.1.2 Benefits of Breastfeeding	7
2.2 Prevalence of Breastfeeding Practices	8
2.3 Factors Influencing Breastfeeding Practices	10
2.3.1 Individual-Level Factors	11
2.3.2 Group-Level Factors	13
2.3.3 Society-Level Factors	16
2.4 Epidemiology of COVID-19 in Malaysia	18

2.5	Movement Control Orders (MCOs) in Malaysia	19
2.6	Impacts of COVID-19 Lockdown on Breastfeeding Practices	21
2.7	Impacts of COVID-19 lockdown on Breastfeeding Support	23
3.0	MATERIALS AND METHODS	26
3.1	Ethical Consideration and Informed Consent	26
3.2	Study Design	26
3.3	Questionnaire Design	27
3.3.1	Section A: Demographic Profile	27
3.3.2	Section B: Infant Feeding Practices and Changes during the COVID-19 Pandemic	28
3.3.3	Section C: Perceived Effects of COVID-19 Lockdown	28
3.3.4	Section D: Perception towards Possible Reasons for Changing Breastfeeding Practices	28
3.4	Sampling Method	29
3.5	Sample Size	30
3.6	Statistical Analysis	31
4.0	RESULTS	33
4.1	Total Number of Eligible Subjects	33
4.2	Demographic Characteristics	33
4.3	Infant Feeding Practices and Changes during the COVID-19 Pandemic	36
4.4	Comparison of Infant Feeding Intention and Changes among Subjects who Delivered Their Babies before, during, and after MCO periods	38
4.5	Comparison of Demographic Characteristics between Subjects who had Changed and not Changed in Breastfeeding Practices after Delivery during the COVID-19 Pandemic	40

4.6	Perceived Effects of COVID-19 Lockdown towards Subjects who had Changed and not Changed in Breastfeeding Practices after Delivery during the COVID-19 Pandemic	43
4.7	Perception towards the Possible Reasons for Changing Breastfeeding Practices between Subjects who had Changed and not Changed in Breastfeeding Practices after Delivery during the Pandemic	45
5.0	DISCUSSION	48
5.1	Infant Feeding Practices and Changes in Breastfeeding Practices during the COVID-19 Pandemic	48
5.2	Association of Infant Feeding Practices and Changes with the Periods of Delivery during the COVID-19 pandemic	49
5.3	Association between Demographic Characteristics and Changes in Breastfeeding Practices during the COVID-19 Pandemic	50
5.4	Association between Perceived Effects of COVID-19 Lockdown and Changes in Breastfeeding Practices during the COVID-19 Pandemic	52
5.5	Association between Perception towards Possible Reasons of Changing Breastfeeding Practices and Changes in Breastfeeding Practices during the COVID-19 Pandemic	54
5.6	Limitation of Study and Future Work	56
6.0	CONCLUSION	59
	REFERENCES	61
	APPENDICES	74

LIST OF TABLES

Table		Page
3.1	Sample size to estimate prevalence with different precision and 95% of confidence	29
4.1	Demographic characteristics of the 107 recruited subjects	33
4.2	Infant feeding practices and changes in the 107 subjects during the COVID-19 pandemic	35
4.3	Comparison of Infant Feeding Intention and Changes among Subjects who Delivered Their Babies before, during, and after MCO periods	37
4.4	Comparison of demographic characteristics between subjects who had changed and not changed in breastfeeding practices after delivery during the COVID-19 pandemic	39
4.5	Perceived effects of covid-19 lockdown towards subjects who had changed and not changed in breastfeeding practices after delivery during the COVID-19 pandemic	42
4.6	Perception towards the possible reasons for changing breastfeeding practices between subjects who had changed and not changed in breastfeeding practices after delivery during the COVID-19 pandemic	44

LIST OF FIGURES

Figure		Page
2.1	Prevalence of exclusively breastfed children aged less than six months in different countries and UNIFEC region from year 2014 to 2020	8
2.2	The daily new cases of COVID-19 in Malaysia from 18 March 2020 to 05 December 2021	18

LIST OF ABBREVIATIONS

HBM	Human breast milk
MCO	Movement Control Order
MOH	Ministry of Health
NRP	National Recovery Plan
UNICEF	United Nations Children's Fund
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

Breast milk is an ideal food for infants to ensure their survival and immediate health. Additionally, breastfeeding is important to ensure normal growth and development of children, improve the short-term health and reduce risk of developing diseases for mothers (KKM, n.d.b; WHO, n.d.a). Breast milk can be delivered to infants via direct breastfeeding or indirect breastfeeding through expressed milk. Breastfeeding can be classified into two types, which are partial breastfeeding and exclusive breastfeeding. Partial breastfeeding refers to feeding the infant with a combination of breast milk and formula milk, solid foods, or other supplementary foods. Meanwhile, exclusive breastfeeding means the infant is fully fed with breastmilk and not fed with any other solid foods or liquids including water, with the exception of essential supplements or medication (Karmaus et al., 2017).

Since breastfeeding is beneficial for both infants and mothers, World Health Organization (WHO), United Nations Children's Fund (UNICEF) and Malaysian Breastfeeding Policy highly recommend exclusive breastfeeding for the first six months of infants' life and continued breastfeeding up to two years old (KKM, 2021b; WHO, n.d.a). Globally, the prevalence of exclusive breastfeeding for infant less than six months old was approximately 44% from 2014 to 2020, whereas only 47.1% of prevalence was indicated in Malaysia in 2016 (Institute for Public Health, Ministry of Health, Malaysia, 2016; UNICEF,

2021a). To achieve the Malaysia's 2025 target of at least 70% of infant being exclusive breastfed up to the first six months of life, numerous strategies have taken by the Malaysia's Ministry of Health including the Lactation Management Training, Breastfeeding Counselling Course for health personnel, and Baby Friendly Hospital Initiative (BFHI) set by WHO and UNICEF (Nutrition Division, Ministry of Health, Malaysia, 2016; KKM, 2021b).

Over 265 million of COVID-19 cases have reported globally since the COVID-19 outbreak in late 2019 (WHO, 2021b). In Malaysia, over 2.6 million cases have been reported as of 05 December 2021 (MOH, Malaysia, 2021). In response to the COVID-19 situation, the lockdown or restriction measures were executed to control the spread of the infection in most countries. Nevertheless, the restriction measures have affected many people in various aspects including economic, social, and health systems. For instance, the interventions for breastfeeding such as face-to-face supports from the healthcare staffs and family members has been limited as a result of lockdown in many countries (WHO, n.d.b).

A few studies have reported on the impacts of COVID-19 lockdown on breastfeeding practices such as in Italy (Latorre et al., 2021), United Kingdom (Brown and Shenker, 2021; Vazquez-Vazquez et al., 2021), Thailand (Piankusol et al., 2021), and China (Yu et al., 2022). The changes in breastfeeding practices were inconsistent among these countries, in which the reduction of breastfeeding rates was highest in Italy (30%), followed by China (28%), UK (13%) and Thailand (4.32%). These inconsistent results may be due

to the different COVID-19 situation and local policies in these countries. Moreover, the period of these surveys was mainly focused from the early-2020 until mid-2020, in which the issues regarding safety of breastfeeding were still confusing at the early stages of COVID-19 outbreak. Additionally, COVID-19 cases at the previous study periods were less serious compared to in 2021. Therefore, an investigation over a longer duration after outbreak should be carried out to determine the overall impacts of the pandemic towards breastfeeding practices.

In Malaysia, the movement control order (MCO) was first implemented on 18 March 2020 and subsequently transformed into the national recovery plan (NRP) on 28 June 2021 (Ganasegeran et al., 2021; Tang, 2021). Currently, there is no published peer-reviewed survey regarding the impacts of COVID-19 pandemic on breastfeeding practices in Malaysia. This study has focused on investigating factors that influence the Malaysian mother's decision on breastfeeding practices during the COVID-19 pandemic. This may not only provide a greater understanding on the significant factors associated to the breastfeeding practices, but also may help to improve the breastfeeding promotion strategies to support the mothers in the future. Furthermore, this study may also evoke the importance of partner, family members, friends, and society in increasing the rates of breastfeeding, particularly during the pandemic.

Therefore, this study was carried out among Malaysian mothers during COVID-19 pandemic to achieve the objectives as below:

- i) To study the association of infant feeding practices and changes with the periods of delivery.
- ii) To explore the association between demographic characteristics and the changes in breastfeeding practices.
- iii) To investigate the association between perceived effects of COVID-19 lockdown and changes in breastfeeding practices.
- iv) To examine the association between perception towards possible reasons for changing breastfeeding practices and changes in breastfeeding practices.

CHAPTER 2

LITERATURE REVIEW

2.1 Breastfeeding

A good nutrition is remarkably important in promoting the growth and maturity of infant during the perinatal period, which could cause short- and long-term health effects (Boquien, 2018). The World Health Organization (WHO), United Nations Children's Fund (UNICEF) and Malaysian Breastfeeding Policy have recommended the early initiation of breastfeeding within the first hour of life and exclusive breastfeeding for the first six months of age. After six months, breastfeeding should be continued along with adequate complementary foods until the child is two years old or beyond (KKM, 2021b; WHO, 2020; WHO, n.d.a).

2.1.1 Composition of Human Breast Milk

Human breast milk (HBM) is a complex and dynamic biofluid, which is made up of nutritional components and non-nutritive bioactive factors (Ballard and Morrow, 2013; Kim and Yi, 2020). According to Michaelsen et al. (1990), HBM composition would change to specifically match the requirements of infant corresponding to its age and other characteristics. This is supported by several researchers, who demonstrated that the composition of HBM varies in response to numerous factors such as lactation stage, diurnal variation, maternal age, maternal diet, and ethnicity (Castellote et al., 2011; Martin et al., 2016; Kim et al., 2019).

For nutrient components, it is well-studied that HBM is made up of nearly 87% of water and 124 g/L macronutrients as the most basic components, which include approximately 7% carbohydrates, 3.8% fat, and 1% protein (Kunz, 1999; Picciano, 2001; Guo, 2014; Riordan and Wambach, 2016). By comparing to mature milk, Kulski and Hartmann (1981) showed that colostrum is low in energy, lactose, and fat. Meanwhile, colostrum is rich in protein and relatively abundant in the immunologic components such as secretory immunoglobulin A (sIgA) and lactoferrin (Kulski and Hartmann, 1981; Kim and Yi, 2020). In addition, HBM typically supplies adequate micronutrients which include minerals and vitamins in varying amount depending on maternal diet, except for vitamins D and K (Ballard and Morrow, 2013; Kim and Yi, 2020). Therefore, the supplementation of vitamins D and K is highly recommended by American Academy of Pediatrics (CDC, 2021).

Furthermore, numerous studies found non-nutritive bioactive factors in HBM which include growth factors, antioxidants, adipokines, and cytokines (Telemeo and Hanson, 1996; Garwolińska, 2018; Castillo-Castañeda et al., 2019). These bioactive compounds could elicit their functions on different body systems, such as the cardiovascular, immune, endocrine, and nervous systems (Watanabe, 2012; Ballard and Morrow, 2013; Shelby et al., 2019). Moreover, several studies have proved the presence of microbiome in HBM. For instances, *Staphylococcus* and *Streptococcus*. The maternal bacteria are vertically transmitted to the infant's gut via HBM, in order to modulate the immune system and endogenous metabolism (Solís et al., 2010; Jost et al., 2014; Asnicar et al., 2017; Murphy et al., 2017). Previous studies conducted by (Alsaweed et

al., 2015; Melnik and Schmitz, 2017) also indicated that HBM contains abundant microRNA which is important for the development of infant's immune system.

2.1.2 Benefits of Breastfeeding

It has been widely reported that the most prominent benefit of breastfeeding is to ensure the infant's survival and immediate health. Multiple investigations have revealed that breastfed infants tend to have lower rates of diseases such as necrotizing enterocolitis, gastrointestinal tract (GIT) infection, respiratory tract infection, as well as the incidence of sudden infant death syndrome, when comparing to the non-breastfed infants (Wright et al., 1989; van den Bogaard et al., 1991; Dewey et al., 1995). For the first six months of life, the morbidity and mortality rates for exclusively breastfed infants are lower than those with partial breastfeeding (Heinig and Dewey, 1996). Previous studies have also demonstrated that breastfed infants showed lowered risk in suffering from chronic diseases including allergies, asthma, obesity, diabetes, hypertension, irritable bowel syndrome, and Crohn's disease through their later childhood and adulthood (Horta et al., 2015; Klopp et al., 2017; Wang et al., 2017; Xu et al., 2017).

In addition, Horwood (2001) and Smith et al. (2003) evidenced the positive association between breastfeeding and cognitive development in childhood, but then their findings were denied by Ip et al. (2007) suggesting the data may be affected by the potential confounders such as paternal and maternal intelligence, marital status, and socioeconomic status. The effect of breastfeeding on the

childhood cognitive development was proved by Ibrahim et al. (2019) with compelling evidence. Ibrahim et al. (2019) found that the cognitive performance of children was significantly related to the total duration of breastfeeding and its effect was more prominent during the psycholinguistic age.

Apart from the benefits for infant, breastfeeding is believed to improve the mother's health in short-term and reduce the risk of developing diseases. Godfrey and Lawrence (2010) reported that the release of oxytocin hormone, which is stimulated by the initiation of breastfeeding immediately after delivery, could help in uterus contraction and reduction of postpartum bleeding. Moreover, exclusive breastfeeding has been shown to reduce the risk of maternal health complications associated with short birth intervals, by delaying ovulation after delivery (Godfrey and Lawrence, 2010). As reported by Rosenblatt and Thomas (1993), breastfeeding mothers tend to have lower risk for osteoporosis, breast cancer, and ovarian cancer. The "Reset Hypothesis" postulates that the beneficial metabolic shifts during lactation remain after the cessation of breastfeeding, could decrease the risk of chronic diseases such as type II diabetes, metabolic, and cardiovascular complications (Stuebe and Rich-Edwards, 2008). Moreover, breastfeeding facilitates the bonding between mother and infant (Leung and Sauve, 2005).

2.2 Prevalence of Breastfeeding Practices

The UNICEF database has revealed only 48% of early initiation of breastfeeding for infants within one hour of birth and only 44% of children aged less than six months were exclusively breastfed from year 2014 to 2020 globally.

It has been reported that the prevalence of exclusive breastfeeding for children aged less than six months was the highest in South Asia and lowest in North America, with 57% and 26% respectively. Eastern and Southern Africa has the second highest prevalence of 55%, subsequently followed by Eastern Europe and Central Asia (41%), Latin America and Caribbean (37%), West and Central Afrika (37%), Middle East and North Afrika (33%), and East Asia and Pacific (31%). Additionally, worldwide prevalence with continued breastfeeding for 12 – 23 months of children was approximately 65%. The UNICEF database suggests a higher prevalence of continued breastfeeding in the poor households compared to the rich (UNICEF, 2021a). Figure 2.1 indicates the prevalence of exclusively breastfed children aged less than six months in different countries and UNICEF region from year 2014 to 2020.

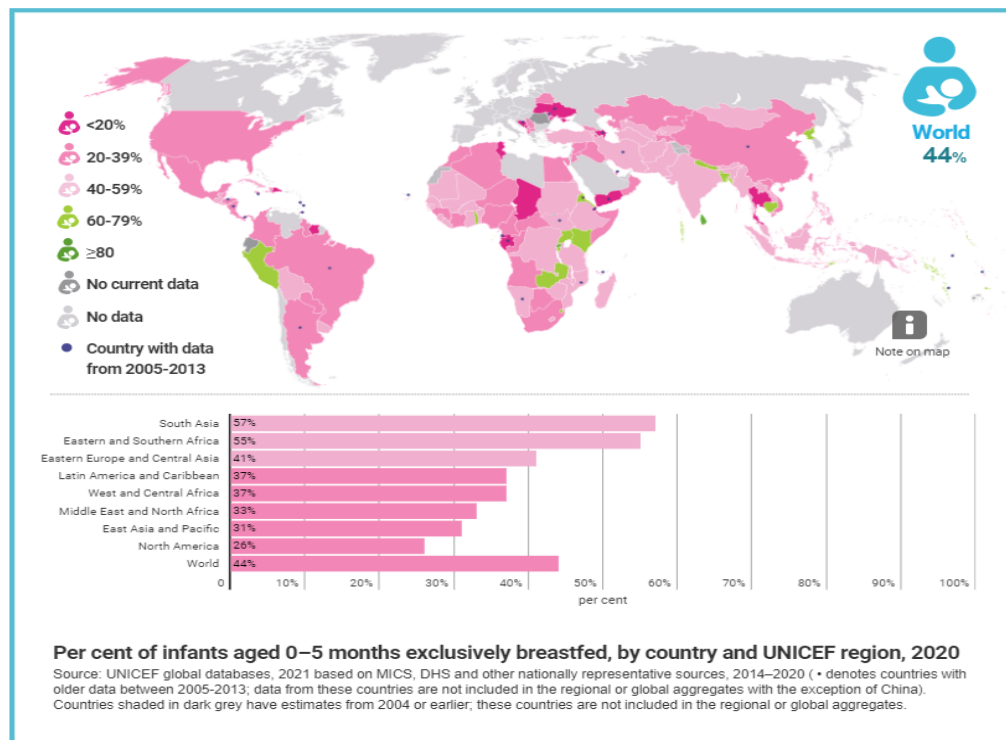


Figure 2.1: Prevalence of exclusively breastfed children aged less than six months in different countries and UNIFEC region from year 2014 to 2020 (Adapted from UNICEF, 2021a).

In Malaysia, the National Health and Morbidity Survey (NHMS) 2016: Maternal and Child Health (MCH) reported that the prevalence of early initiation of breastfeeding for infants within one hour of birth was 65.3% while the prevalence of infants ever been breastfed was 98.1% (Institute for Public Health, Ministry of Health, Malaysia, 2016). For children aged under six months, only 47.1% of exclusive breastfeeding was indicated. The prevalence of continued breastfeeding among children aged 20 – 24 months was reported as 39.4% (Institute for Public Health, Ministry of Health, Malaysia, 2016). In the National Plan of Action for Nutrition of Malaysia (NPANM) 2016–2025, Ministry of Health Malaysia (MOH) has set 2025 targets of achieving 100% early initiation of breastfeeding within one hour of birth and more than 70% exclusive breastfeeding for the children under six months old (Nutrition Division, Ministry of Health, Malaysia, 2016). Although the prevalence of early initiation of breastfeeding and exclusive breastfeeding in Malaysia was slightly above the worldwide average, it is still far from the 2025 targets set by MOH.

2.3 Factors Influencing Breastfeeding Practices

Even though several studies have evidenced the benefits of breastfeeding, numerous factors that could influence the breastfeeding practices have been reported. According to a systemic review by Patil et al. (2020), the factors that could influence breastfeeding practices can be classified into three levels: individual, group, and society. It was suggested that the decision towards breastfeeding practices is a multifactorial issue, in which some of the factors could be interlinked (Patil et al., 2020).

2.3.1 Individual-Level Factors

Individual-level factors that could influence the breastfeeding practices mainly include maternal health, lack of knowledge on breastfeeding, painful and latching problems, insufficient milk, and lethargy.

Both physical and mental health conditions of mother are essential in breastfeeding practices. Previous research showed that breast health problems, which include breast abscesses, sore nipples, and other lactation complications, have shortened the period of breastfeeding practices (Otoo et al., 2009; Nabulsi, 2011; Nuzrina et al., 2016). A cross-sectional study conducted by Nawaz et al. (2009) reported that mothers with chronic diseases are less likely to breastfeed their children. Meanwhile, exclusive breastfeeding was observed to be negatively influenced by the mothers' emotions such as being worried and inconfident in breastfeeding (Hinsliff-Smith et al., 2014; Nuzrina et al., 2016). This was further supported by Diji et al. (2017), which indicated that the lowered rates of exclusive breastfeeding were related to mothers' depressive symptoms and emotional stress.

The perception of breastfeeding as the best source of nutrition for infants is well-recognised by most of the mothers. However, most of them are lacking of knowledge about the specific benefits of breastfeeding and the risks without breastfeeding practices (Gibson, 2005; McCann et al., 2007). Based on Hinsliff-Smith et al. (2014) and Jama et al. (2017), mothers with a poor understanding in breastfeeding were less willing to practice it. For instance, lacking of knowledge in positioning and latching skills (Jama et al., 2017).

Moreover, numerous studies have shown that the improper latching skills are associated to the reduced rates of exclusive breastfeeding (Taveras et al., 2004; Santo et al., 2007; Jama et al., 2017). Apart from that, babies' rejection of latching on the breasts has become a factor that influence breastfeeding (Agunbiade and Ogunleye, 2012). Swelling and pain in breasts are also reasons to stop breastfeeding (Agunbiade and Ogunleye, 2012). Similarly, a study by Nabulsi (2011) has demonstrated that mothers with experience of painful in breastfeeding have less tendency to exclusively breastfeed their children.

Furthermore, mothers' perception of insufficient breast milk was frequently recognised as a barrier in exclusive breastfeeding (Agnarsson et al., 2001; Otoo et al., 2009; Nabulsi, 2011; Agunbiade and Ogunleye, 2012; Nuzrina et al., 2016; Jama et al., 2017). A house-to-house interview survey as carried out by Agnarsson et al. (2001) reported that most mothers were prone to believe that their children cry after breastfeeding was due to insufficient milk supply. The problems with poor milk supply were caused by the improper breastfeeding skills or infrequent feeding (Amir, 2006). In contrast, a cross-sectional study by Dearden et al. (2002) reported the mothers who believed they had sufficient breast milk were more likely to exclusively breastfeed their children.

In addition, the frequent intervals in exclusive breastfeeding can be exhausting for mothers as it could lead to sleep deprivation and increased irritability (Nabulsi, 2011). Additionally, some mothers have quit breastfeeding because they felt unable to meet the milk requirement of their children (Jama et al., 2017). It is commonly known that mothers would choose to feed their children with

formula milk if they agreed with the statement “formula feeding being more convenient than breastfeeding” (Karande and Perkar, 2012; Hawley et al., 2015).

2.3.2 Group-Level Factors

The inappropriate information from healthcare workers, negative influence from family members and society, poor support from family and partner, returning to work, and lack of privacy in public spaces are the group-level factors that might influence breastfeeding practices.

The inappropriate information from healthcare workers has been examined as a crucial factor that influenced the breastfeeding decision of mothers (Hinsliff-Smith et al., 2014; Nuzrina et al., 2016; Jama et al., 2017). This is consistent with the findings by Hossain et al. (1992), which demonstrated that mothers had 5.5 times increased chances of pre-lacteal feedings if they received maternity services from non-professional birth attendants. Meanwhile, Teich et al. (2014) reported that mothers were prone to feel difficulty in breastfeeding if formula feeding was recommended by the healthcare workers, particularly when their babies were in the neonatal intensive care unit. Besides, a cross-sectional study performed by Yeneabat et al. (2014), indicated that the rates of stopping exclusive breastfeeding were increased by 1.81 times in the absence of post-natal healthcare counselling.

In addition, several studies have suggested that mothers’ decision in infant feeding can be easily affected by elder people, which could be their grandmothers, mothers-in-law, and even relatives (Otoo et al., 2009; Nabulsi,

2011; Jama et al., 2017). For example, mothers tend to feed their babies with formula milk if it was suggested by their family members (Nuzrina et al., 2016). Jama et al. (2017) also claimed that traditional medicine or foods such as porridge are probably fed to the infants by mothers who accept the advice from the elderly. Moreover, a reduced rate of exclusive breastfeeding was reported among mothers who gained the information of breastfeeding from their friends (Ku and Chow, 2010). Another example of negative influence was examined from the mass media which aggressively promotes the nutritional compositions of formula milk and other infant supplements (Duong et al., 2005). This was in agreement with a study by Piwoz and Huffman (2015), which showed that the intention and confidence among mothers in breastfeeding were affected by the biased messages and excessive advertisements of formula milk from the mass media.

According to Rahman et al. (2011), lack of family support in handling household chores has increased the difficulties of mothers in breastfeeding practices, in which the mothers might have insufficient time for breastfeeding. Conversely, Nabulsi (2011) proposed that strong family support has enhanced the period of breastfeeding by mothers. Additionally, attitudes and support from partner are also essential in determining the mothers' decision in breastfeeding (Arora et al., 2000; Wolfberg et al., 2004). Numerous studies have analysed the reasons of partners opposed to breastfeeding, which include their worries in failure of bonding with their children if they were unable to provide breastfeeding to their children like the mothers did. Furthermore, they worried their wife would fail in handling the household chores if breastfeeding was

practiced (Scott and Binns, 1999; Dennis, 2002; Moore et al., 2007). Additionally, Otoo et al. (2009) reported that fathers are more prone to spend money on the formula milk or supplements for children compared to mothers' nutrition. Thus, they tend to encourage their wife to feed babies with formula milk rather than breast milk.

Multiple studies have demonstrated the decreased rates of exclusive breastfeeding in mothers who had returned to work after delivery (Otoo et al., 2009; Nabulsi, 2011; Jama et al., 2017). Based on Yeneabat et al. (2014), mothers tend to feed their infants with additional foods at the early of life, assuming they could accept other food than breast milk after the mothers returned to work. The difficulties in breastfeeding faced by working mothers are due to inflexible work hours and locations, lack of private spaces for expressing breast milk, lack of storage space for expressed milk, difficult to find childcare services, and lack of maternity leave benefits (Kimbrow, 2006; Hawkins et al., 2007; Johnston and Esposito, 2007). In contrast to the difficulty of inflexible work hours, Santo et al. (2007) revealed that working mothers with unspecified working hours were less likely to practice breastfeeding compared to those with fixed work hours.

In accordance with the findings by Jama et al. (2017), many mothers revealed that finding suitable and comfortable places for breastfeeding in the public spaces was difficult. This corresponds to study by Hinliff-Smith et al. (2014), which reported that mothers are embarrassed of being stared at by surrounding people when they breastfeed. Patil et al. (2020) also stated that despite the

existence of projects favouring breastfeeding-friendly public spaces, the implementation was still limited by the issues of infrastructure and behaviours. Apart from the public settings, Hinslif-Smith et al. (2014) reported that mothers would also feel embarrassed to breastfeed at home if they stay with other family members.

2.3.3 Society-Level Factors

Society-level factors that could influence the breastfeeding practices include maternal age, education level, economic status, residence area, and parity.

Previous study has demonstrated that the tendency of exclusive breastfeeding is lower among mothers aged less than 20 years old or more than 35 years old, compared to mothers aged between 20 to 35 years old (Santo et al., 2007; Okafor et al., 2013). In line with the earlier study, Mosquera et al. (2019) showed that mothers aged less than 19 years old were less likely to exclusively breastfeed. On the contrary, a cross-sectional study conducted by Topothai et al. (2021) reported that mothers aged more than 30 years old have higher tendency to breastfeed. However, other demographic characteristics, such as education level, household income, and living region, must also be considered along with the maternal age (Topothai et al., 2021).

In addition, low maternal education has been investigated as a barrier of exclusive breastfeeding in several studies (Vaahtera et al., 2001; Ludvigsson and Ludvigsson, 2005; Okafor et al., 2013). This is supported by Topothai et al. (2021), who indicates a positive association between maternal education and exclusive breastfeeding. On the contrary, a longitudinal study carried out by

Saffari et al. (2016) has reported that mothers who received education for 16 years and above were less likely to have exclusive breastfeeding. However, in another study, the exclusive breastfeeding is not significantly associated with the maternal education (Mosquera et al., 2019).

A decreased rate of breastfeeding among mothers in low-income families has been reported by Muchacha and Mtetwa (2015). This is consistent with the findings by Thet et al. (2016), which revealed a shorter duration of breastfeeding among mothers with low family income. It was stated that these mothers stopped breastfeeding as they were unable to afford the daily nutritious foods, hence affected their nutritional status for breast milk production (Thet et al., 2016). However, findings by Barennes et al. (2012) showed that the tendency of exclusive breastfeeding cessation increases along with the family income level.

Moreover, mothers living in the urban areas are more prone to fulfil the recommended infant feeding method because of the higher living standards (Vaahtera et al., 2001). Conversely, Barennes et al. (2012) found that the rate of using breast milk replacements for children aged below six months in the urban areas was higher compared to the rural areas. This is in line with the findings by Yeneabat et al. (2014), whereby an increased chance of breastfeeding cessation among mothers who lived in urban residence. The main reason was reported due to higher proportion of employed mothers in the urban settings than in the rural settings, whereby they must return to work around one month after childbirth (Yeneabat et al., 2014).

Furthermore, primiparous mothers are less likely to exclusively breastfeed their children compared to multiparous mothers (Whalen and Cramton, 2010). In line with the findings by Whalen and Cramton (2010), Moraes de Oliveira and Camelo (2017) reported that first-time mothers have lesser tendency in exclusive breastfeeding compared to mothers with more children. In another study, multiparous mothers have been shown to be more confident in exclusive breastfeeding due to their previous successful experiences and the beneficial effects of breastfeeding (Mundagowa et al., 2019). On the other hand, the early cessation of exclusive breastfeeding for mothers with two children or more could be contributed by other factors such as maternal employment, lack of support, and low family income (Balogun et al., 2015).

2.4 Epidemiology of COVID-19 in Malaysia

In late 2019, an infectious disease known as COVID-19 caused by a novel coronavirus, SAR-CoV-2, emerged in Wuhan, China, and rapidly spread throughout the world (Lai et al., 2020). As the number of cases has exponentially duplicated and spread over hundreds of countries, WHO has declared the outbreak of COVID-19 as a global pandemic on 11 March 2020 (Cucinotta and Vanelli, 2020).

In Malaysia, as of 05 December 2021, the national confirmed cases and cumulative deaths have been reported as up to 2.6 million and 30 thousand respectively (WHO, 2021a). From the initial lockdown in Malaysia on 18 March 2020, through May 2020, the incidence of COVID-19 in Malaysia was relatively low, with an average of 95 cases/day. Then, the transmission rate

further decreased until an average of 17 cases/day from June to August 2020. However, the cases began to increase between September and November 2020 (average 620 cases/day) and continued to rise from December 2020 to February 2021 (average 2,612 cases/day) and from March to May 2021 (average 2,953 cases/day). It was obvious that there was a massive increase in incidence from June to August 2021, with a daily maximum of 24,599 cases on 26 August 2021. After that, the cases slowly dropped to an average of 9,743 cases/day from September to November 2021 and further decreased to 5,198 cases/day as of 05 December 2021 (MOH, Malaysia, 2021). Figure 2.2 illustrates daily new cases of COVID-19 in Malaysia from 18 March 2020 to 05 December 2021.

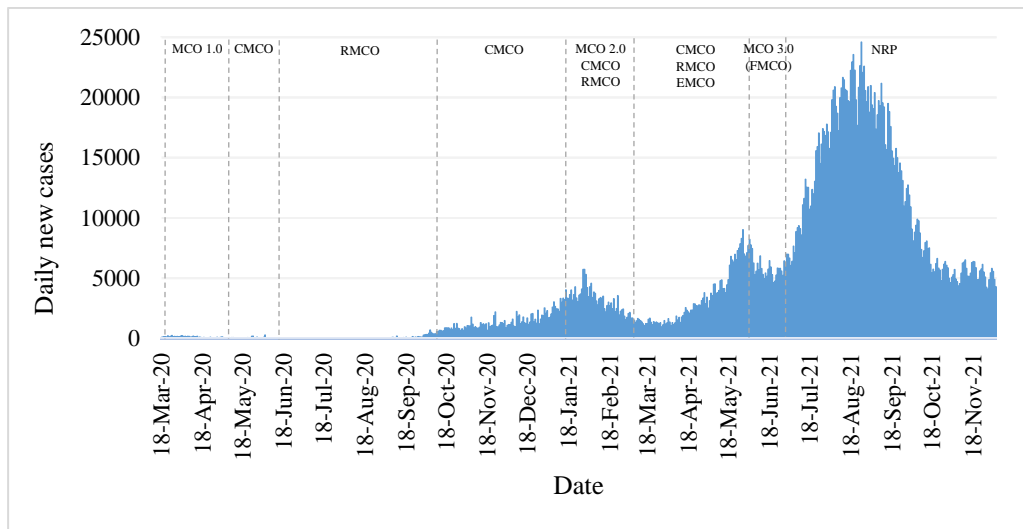


Figure 2.2: The daily new cases of COVID-19 in Malaysia from 18 March 2020 to 05 December 2021 (Data retrieved from MOH, Malaysia, 2021).

2.5 Movement Control Orders (MCOs) in Malaysia

In response to the COVID-19 pandemic, the Malaysian Government had enforced the first movement control order (MCO) commencing on 18 March 2020, which was issued under the Prevention and Control of Infectious Diseases

Act 1988 and the Police Act 1967 (Ganasegeran et al., 2020). During the first MCO period, the restrictions were rigorous as follow: (1) prohibition of all types of activities involving mass movements such as sport, religious, social and cultural activities; (2) closure of all levels of education institutions; (3) closure of all business premises with the exception of the daily supplies field; (4) closure of all government and private premises excluding the essential services like water and electricity, telecommunications, pharmacy, health institutions, etc.; (5) entry restrictions of all tourists and foreign visitors (Ganasegeran et al., 2020). In short, all individuals in Malaysia were not allowed to leave their residence during the first MCO period except for buying daily supplies or working in the essential fields.

With the declining trend of the COVID-19 cases, the restrictions were relaxed by the implementation of the conditional movement control order (CMCO) on 4 May 2020 (Jayaraj et al., 2021). In this phase, most economic industries were permitted to operate by adhering to the SOPs such as social distancing and recording the names and contact numbers of customers together with the dates and times upon their entries and exits. The outdoor sport activities which involve less than 10 people were also allowed during the CMCO (Ganasegeran et al., 2020). Then, the restrictions were further loosened into the recovery movement control order (RMCO) on 9 June 2020, in which most of the activities were permitted by adhering to the SOPs (Jayaraj et al., 2021).

However, the restrictions were intensified back to CMCO on 7 October 2020 due to the increased cases. From 13 January to 5 March 2021, the reinstatement

of MCO was carried out in five states which included Johor, Malacca, Penang, Sabah, and Selangor, as well as the three federal territories of Malaysia (New Straits Times, 2021). Meanwhile, the CMCO, RMCO, and enhanced MCO (EMCO) were placed in the other states based on the severity of COVID-19 situation until the enforcement of full MCO (FMCO) throughout Malaysia on 1 June 2021 (Jayaraj et al., 2021).

On 15 June 2021, the National Recovery Plan (NRP) was announced to fully replace the MCOs after FMCO ended on 28 June 2021 (Tang, 2021). The NRP is divided into four phases based on the COVID-19 incidence rates and the vaccination percentages. In addition, the restrictions on social activities and even interstate travel during NRP became more eased than during the MCOs due to the increased proportion of vaccinated population (Tang, 2021).

2.6 Impacts of COVID-19 Lockdown on Breastfeeding Practices

To date, there is only a limited number of studies regarding the impacts of the COVID-19 pandemic on breastfeeding practices, which were carried out in Italy, United Kingdom (UK), Thailand, and China.

Based on a control cohort study by Latorre et al. (2021), in Italy, the percentage of exclusive breastfeeding at discharge after delivery was significantly reduced by 30% from 2018 (97.7%) to the lockdown period (69.4%) between 9 March to 8 May 2020. Of these, about 80% remained exclusive breastfeeding at the 30th day after delivery in 2018 (76.3%) and lockdown period (54.3%), followed

by a dramatic drop at the 90th day after delivery in the lockdown period (31.8%) compared to in 2018 (70.5%) (Latorre et al., 2021).

In United Kingdom (UK), the data collected by Vazquez-Vazquez et al. (2021) between 27 May and 3 June 2020, revealed that only 13% of mothers who gave birth before and during lockdown reported changes in the feeding practices for baby aged 0-12 months due to the lockdown. Among the breastfeeding mothers, the feeding frequency and duration increased 30% and 17% respectively. However, 10% and 15% decrease was found in the feeding frequency and duration respectively (Vazquez-Vazquez et al., 2021). These changes in the frequency and duration of breastfeeding were consistent with another study conducted by Brown and Shenker (2021) in the UK during the similar period (May to June 2020). In that study, 41.8% of mothers with baby aged under 12 months felt positive impacts of lockdown towards breastfeeding practices, while 27.0% reflected it was negative.

In contrast to the previous findings in Italy and UK, a cross-sectional study by Piankusol et al. (2021) in Thailand conducted from 17 July 2020 to 11 February 2021, reported a slight reduction (4.32%) in the breastfeeding practices for children aged 0-12 months in response to the COVID-19 lockdown restrictions. Furthermore, 1.44% of breastfeeding mothers reduced frequency and 0.44% stopped breastfeeding in Thailand during the pandemic.

In China, a cross-sectional study by Yu et al. (2022) undertaken from 1 August 2020 to 31 October 2020, reported 28% of changes in the actual feeding

practices from the feeding intention for the first six months of babies. Besides, mothers delivered during lockdown (68.1%) were more likely to breastfeed their babies at the first six months of life, compared to those delivered before lockdown (60.9%). The infant feeding methods for the first six months of babies and changes in actual feeding practices from the feeding intention were significantly associated with the periods of delivery, which were before and during lockdown. On the contrary, there was no association between feeding intention before delivery and the periods of delivery.

As reported by WHO (2021c), the average of COVID-19 cases was relatively close between the two different study periods in Italy and UK, which were around 3000 cases per day. In contrast, a low average of daily new cases with only 100 cases and less than 50 cases were reported during the study periods in Thailand and China respectively (WHO, 2021c). Collectively, these studies highlighted that the changes in breastfeeding practices were inconsistent among different countries and could be even affected by the periods of study.

2.7 Impacts of COVID-19 lockdown on Breastfeeding Support

The existing research in UK and Thailand has suggested the insufficient feeding support from the healthcare services as the most significant factor associated with the changes of breastfeeding practices during the COVID-19 lockdown periods (Brown and Shenker, 2021; Piankusol et al., 2021; Vazquez-Vazquez et al., 2021). On the contrary, previous research in China revealed that sufficient support in breastfeeding practices were received by both mothers who delivered before and during lockdown (Yu et al., 2022).

The previous findings also reported that lack of face-to-face contact and support from family due to social distancing as being the critical reasons in changing the breastfeeding practices (Brown and Shenker, 2021; Piankusol et al., 2021; Vazquez-Vazquez et al., 2021). In addition, both Brown and Shenker (2021) and Vazquez-Vazquez et al. (2021) reported that mothers were concerned about insufficient breast milk, painful, and latching issues due to inadequate breastfeeding support during lockdown in UK. The inconsistent findings were demonstrated in China, in which mothers who delivered during lockdown received much greater assistance from their partners compared to those delivered before lockdown (Yu et al., 2022). This might be because husbands had more time at home due to the “work from home” measures during lockdown (Yu et al., 2022).

In Thailand, the changes in breastfeeding practices were not associated to the online support groups like the mothers’ groups, which was different to that reported in UK. Furthermore, the complications caused by the COVID-19 pandemic including family stress from confinement, household crowding during lockdown, and activity restrictions, were found not relevant to the breastfeeding practices in Thailand (Piankusol et al., 2021).

The inconsistent outcomes between the studies could be explained by the variation of social awareness and mass communication which were related to the COVID-19 issues among these countries (Piankusol et al., 2021). Moreover, the critical changes in breastfeeding practices may be influenced by the uncertainty and confusion of local policy and the issues regarding the safety of

breastfeeding at the early stages of the COVID-19 pandemic (Vazquez-Vazquez et al., 2021). Therefore, an investigation over a longer period after the COVID-19 outbreak should be carried out, in order to observe the changes of breastfeeding practices along with different stages of the pandemic.

CHAPTER 3

MATERIALS AND METHODS

3.1 Ethical Consideration and Informed Consent

Prior to the commencement of the study, the ethical approval was granted by Universiti Tunku Abdul Rahman (UTAR) Scientific and Ethical Review Committee (Appendix A). The informed consent was obtained from the participants at the beginning of the survey before they could proceed to the first question in the first section (Appendix B).

3.2 Study Design

A cross-sectional study was conducted from 9 November to 22 December 2021 among Malaysian mothers who breastfed or currently breastfeeding their youngest baby. The eligible mothers must live in Malaysia during the time of breastfeeding and their youngest baby must not be older than 24 months old at the moment when they accessed the questionnaire. The baby age ranging from 0 to 24 months were selected to represent the different periods of delivery, which were before the first MCO, during the different stages of MCOs, and after the MCOs transforming into the national recovery plan (NRP) in Malaysia.

The exclusion criteria for the subjects in this survey are Malaysian mothers who live in foreign countries, such as Singapore, Taiwan, and United States, during the time of breastfeeding. The maternal and neonatal conditions that may affect the breastfeeding practices were also be excluded. For instances, the mothers

who were currently infected with human immunodeficiency virus (HIV), tuberculosis, or had lesions caused by herpes simplex virus on both breasts, as well as babies diagnosed with galactosemia, were not eligible for this study (Latorre et al., 2021). The inclusion and exclusion criteria were included at the beginning part of the survey, in order to avoid the ineligible subjects.

3.3 Questionnaire Design

The questionnaire comprised of four sections, including (1) Section A: Demographic Profile; (2) Section B: Infant Feeding Practices and Changes during the COVID-19 Pandemic; (3) Section C: Perceived Effects of COVID-19 lockdown; (4) Section D: Reasons to Change Breastfeeding Practices during the COVID-19 Pandemic. All questions in all sections were compulsory to be answered by the subjects (Appendix C).

3.3.1 Section A: Demographic Profile

The questions in section A were related to the demographic characteristics, including the maternal age, marital status, ethnicity, educational level, household income, residence area, living region, total number of children, infant age, and the periods of delivery.

Based on Lim (2002), the living region in Malaysia was classified into five main regions: Central Region (Selangor, Kuala Lumpur, Putrajaya), Southern Region (Johor, Negeri Sembilan, Melaka), Northern Region (Perak, Penang, Kedah, Perlis), East Coast Region (Kelantan, Pahang, Terengganu), and East Malaysia (Sabah and Sarawak).

3.3.2 Section B: Infant Feeding Practices and Changes during the COVID-19 Pandemic

Section B has closed-ended questions to examine whether the mothers have changed their feeding plan and how they have changed the breastfeeding practices due to the pandemic. The questions asked about the feeding intention before delivery, the actual feeding practice during the first six month of infant's age, as well as whether they have reduced the breastfeeding frequency and stopped breastfeeding due to the pandemic. These questions were adapted from studies by Brown and Shenker (2021) and Piankusol et al. (2021).

3.3.3 Section C: Perceived Effects of COVID-19 Lockdown

The questions in section C focused on how the pandemic has affected the family situations positively or negatively, as well as the perceived support on breastfeeding during the pandemic by using the 4-point Likert scale (1–never; 2–sometimes; 3–often; 4–mostly). The questions were adapted from Piankusol et al. (2021), including household crowding during lockdown, family stress from confinement, lack of family support in feeding baby, infant feeding support from health personnel, sufficient maternal health support, and contact with mothers-to-mothers breastfeeding support groups.

3.3.4 Section D: Perception towards Possible Reasons for Changing Breastfeeding Practices

A 5-point Likert scale (1–strongly disagree; 2–disagree; 3–neutral; 4–agree; 5–strongly agree) was used in section D to represent the degree of the participants' agreement with a series of reasons for changing the breastfeeding practices during the pandemic. This section was adapted from Brown and Shenker (2021), in which the reasons listed including lack of face-to-face support, safety fears,

positive for COVID-19 infection, exhaustion or stress, issue with latch or pain, insufficient milk, embarrassment, partner not supportive, family not supportive, and work responsibility.

3.4 Sampling Method

A non-probability sampling technique known as convenience sampling was used in this survey. The reason of choosing this sampling method was due to the COVID-19 situation during the time of survey, in which the researcher and subjects were more accessible via this method. The questionnaire was created in the online google form and the main platform for data collection was the Malaysians breastfeeding-related groups on Facebook, including “The Breastfeeding Advocates Network, TBAN”, “Feed by Momma – Group Breastfeeding Ibu Menyusu Malaysia”, “Breastfeeding Mother to Mother Support Group, Malaysia”, “Kelab Ibu Mengandung dan Menyusu” and “Malaysia Breast Pump Specialist”.

These breastfeeding-related groups are in private settings and its entrance is strictly permissive to women only. Before joining the groups, few simple questions regarding the gender and the purpose of joining group were required and reviewed by the group admins. After joining the groups, private messages were sent to the group admins via Facebook Messenger to obtain approval for posting the questionnaire. The background of researcher and the objectives of the survey were clearly stated in the caption of posting, attached with the contact number of researcher for the survey-related inquiry purpose. A request for help

in sharing the questionnaire to the other eligible subjects was also included in the last part of the survey once the subjects had completed the questionnaire.

3.5 Sample Size

The target sample size in this cross-sectional study was calculated by using the formula adopted from Pourhoseingholi et al. (2013):

$$n = \frac{Z^2 P(1 - P)}{d^2}$$

where n = sample size,

Z = statistic corresponding to confidence level,

P = expected prevalence,

d = precision corresponding to effect size.

The expected prevalence of 4.32% mothers who changed the breastfeeding practices during COVID-19 pandemic was obtained from a previous study of Piankusol et al. (2021) in Thailand. As considering the length of data collection period, a confidence level of 95% was aimed and a precision of 4% was selected by adhering to the suggestion by Pourhoseingholi et al. (2013) as illustrated in Table 3.1.

Table 3.1: Sample size to estimate prevalence with different precision and 95% of confidence (Adopted from Pourhoseingholi et al., 2013).

Precision	Assumed Prevalence		
	0.05	0.2	0.6
0.01	1825	6147	9220
0.04	114	384	576
0.10	18	61	92

Since $P = 0.0432$ (Piankusol et al., 2021),

$d = 0.04$ (Pourhoseingholi et al., 2013),

$Z = 1.96$ at 95% confidence level,

$$n = \frac{(1.96)^2(0.0432)(1 - 0.0432)}{0.04^2}$$

$$n = 99.24$$

$$n \approx 100.$$

Thus, the target sample size (n) in this survey was approximately 100 subjects.

3.6 Statistical Analysis

The software of IBM SPSS Statistics version 26 was used to analyse the data in this study. The variables were first classified into different scales of measurement, which were ratio, ordinal, or nominal scales. The Likert-scale variables were classified as ordinal data instead of interval data because the

distances between the rank of responses were not quantifiable (Sullivan and Artino, 2013). The ratio scale variables such as maternal age, total number of children, and youngest baby's age were then categorized into ordinal scales for further analysis.

The categorical data, including both ordinal and nominal data, for the demographic characteristics and infant feeding practices and changes were demonstrated in frequency distribution with percentages. Then, Fisher's exact test were performed to examine the association of infant feeding practices and changes with the periods of delivery. In addition, the associations between changes in breastfeeding practices and three aspects which included demographic characteristics, perceived effects of COVID-19 lockdown and perception towards possible reasons of changing breastfeeding practices were also investigated by using the Fisher's exact test (Kim, 2017). A *p*-value less than 0.05 was considered statistically significant.

CHAPTER 4

RESULTS

4.1 Total Number of Eligible Subjects

A total of 160 responses were obtained in this study. Prior to data analysis, the data collected were screened to ensure the eligibility of the subjects. There were 39 (24.38%) ineligible participants, who did not meet the inclusion criteria or had met the exclusion criteria, being excluded from the data processing. Among the 121 eligible participants, only 108 participants (89.26%) have signed the informed consent form and have completed the questionnaire. However, there was one invalid response being detected and removed from the data, in which the participant answered “one” as her age. Eventually, a total of 107 eligible subjects were proceeded to the statistical analysis.

4.2 Demographic Characteristics

Statistical analysis of the samples revealed that 47 subjects (43.9%) were in the age group of 26 – 30, whereas only five subjects aged less than 25 (4.7%). Out of 107 subjects, only one (0.9%) was in the marital separation state. The ethnicity of the subjects was predominantly Chinese, which accounted for 86% of the subjects. This might be because mothers in the Mandarin-orientated breastfeeding group on Facebook responded more actively than those in the English- or Malay- orientated groups during the time of survey.

In this study, majority of the subjects were having tertiary education level, which comprised of 83 subjects (77.6%), while only one subject was having primary education level (0.9%). This might be due to the questionnaire was only in English, thereby only mothers with English language proficiency were able complete it. Meanwhile, mothers with higher education level were more likely to have the English language proficiency compared to those with a lower education level. Furthermore, the percentages of household income among the categories of \leq RM 4000, RM 4001 – 8000, and \geq RM 8001 were similar, which were 29.0%, 35.5%, and 35.5% respectively.

In addition, most of the subjects are living in the urban area and they are form the Central Region, which accounted for 88.8% and 48.6% respectively. This might be because these areas had more advanced Internet service, making the questionnaire more accessible to the subjects. Besides, majority of the subjects was having one (49.5%) or two (41.1%) children. Among the youngest baby's age, the percentages for 0 – 6 months, 7 – 12 months, and 13 – 18 months were almost equal, which were 28.0%, 29% and 29% respectively. However, only 14.0% of babies were aged 19 – 24 months old at the time of data collection. Furthermore, these subjects mainly delivered their babies during the period of MCOs (64.5%). The detailed demographic characteristics were summarized in Table 4.1.

Table 4.1: Demographic characteristics of the 107 recruited subjects.

Characteristics	Frequency (<i>n</i> = 107)	Percentage (%)
Age		
≤ 25	5	4.7
26 – 30	47	43.9
31 – 35	41	38.3
≥ 36	14	13.1
Marital status		
Single	-	-
Married	106	99.1
Other	1	0.9
Ethnicity		
Malay	6	5.6
Chinese	92	86.0
Indian	7	6.5
Others	2	1.9
Education level		
Primary	1	0.9
Secondary	23	21.5
Tertiary	83	77.6
Household income (RM)		
≤ 4000	31	29.0
4001 – 8000	38	35.5
≥ 8001	38	35.5
Residence area		
Urban	95	88.8
Rural	12	11.2
Living region		
Central Region	52	48.6
Southern Region	26	24.3
Northern Region	14	13.1
East Coast Region	1	0.9
East Malaysia	14	13.1
Total number of children		
1	53	49.5
2	44	41.1
≥ 3	10	9.3
Youngest baby's age (in months)		
0 – 6	30	28.0
7 – 12	31	29.0
13 – 18	31	29.0
19 – 24	15	14.0
Period of delivery		
Before first MCO	12	11.2
During MCOs	69	64.5
After MCOs/ during NRP ¹	26	24.3

¹ National Recovery Plan.

4.3 Infant Feeding Practices and Changes during the COVID-19 Pandemic

In this study, most subjects intended to exclusively breastfeed their babies before delivery, which was 68.2%. Meanwhile, there were seven subjects (6.5%) indicating that they had no plan on the feeding practices before delivery. After delivery, the subjects who had practiced exclusive breastfeeding for the six months of babies decreased slightly to 63.6%, when comparing to their intention of exclusive breastfeeding.

Apart from those who had no feeding intention before delivery, 17.8% of subjects changed their actual breastfeeding practice from the original intention after delivery, whereas 75.7% of the subjects continued to feed their babies according to their original feeding intention. Furthermore, there was only 6.5% and 2.8% of subjects revealed that they had reduced the breastfeeding frequency and stopped the breastfeeding practice, respectively. The infant feeding practices and changes of the 107 subjects during COVID-19 pandemic were clearly demonstrated in Table 4.2.

Table 4.2: Infant feeding practices and changes in the 107 subjects during the COVID-19 pandemic.

Variables	Frequency (n = 107)	Percentage (%)
Feeding intention for the first six months of baby before delivery		
Exclusive breastfeeding	73	68.2
Partial breastfeeding ¹	26	24.3
Formula feeding	1	0.9
No plan	7	6.5
Breastfeeding practice for the first six months of baby after delivery		
Exclusive breastfeeding	68	63.6
Partial breastfeeding	39	36.4
Changes in breastfeeding practices after delivery		
Yes	19	17.8
No	81	75.7
No plan before delivery	7	6.5
Reduction in breastfeeding frequency due to COVID-19 pandemic		
Yes	7	6.5
No	100	93.5
Breastfeeding cessation due to COVID-19 pandemic		
Yes	3	2.8
No	104	97.2

¹ Includes mixed breastfeeding with formula milk or solid foods.

4.4 Comparison of Infant Feeding Intention and Changes among Subjects who Delivered Their Babies before, during, and after MCO periods

As summarised in Table 4.3, a significant association was indicated between the feeding intention for the first six months of baby before delivery and the periods of delivery ($p = 0.002$). Besides, a strong tendency of having association was observed between the changes in actual breastfeeding practices from the feeding intention and the periods of delivery ($p = 0.051$). In contrast, the breastfeeding practices for the first six months of baby after delivery, reduction in breastfeeding frequency and breastfeeding cessation were not associated with the periods of delivery ($p > 0.05$).

In this study, majority of subjects who delivered their babies before the first MCO intended to partially breastfeed (66.7%) their babies for the first six months of birth. On the contrary, those subjects who delivered during and after MCO periods more intended to exclusively breastfeed their babies for the first six months of birth, which accounted for 68.1% and 84.6% respectively. Interestingly, all subjects who did not have a feeding plan before delivery were those who gave birth during the MCO periods.

Surprisingly, the percentage of changing breastfeeding practices from the initial feeding intention for subjects who delivered after MCO period (34.6%) was higher than those delivered before (16.7%) and during (11.6%) MCO periods.

Table 4.3: Comparison of Infant Feeding Intention and Changes among Subjects who Delivered Their Babies before, during, and after MCO periods.

Variables	Before MCO (<i>n</i> =12; 11.2%) <i>n</i> (%)	During MCOs (<i>n</i> =69; 64.5%) <i>n</i> (%)	After MCOs/ during NRP ¹ (<i>n</i> =26; 24.3%) <i>n</i> (%)	<i>p</i> -value
Feeding intention for the first six months of baby before delivery				0.002*
Exclusive breastfeeding	4 (33.2)	47 (68.1)	22 (84.6)	
Partial breastfeeding ²	8 (66.7)	15 (21.7)	3 (11.5)	
Formula milk	-	-	1 (3.8)	
No plan	-	7 (10.1)	-	
Breastfeeding practice for the first six months of baby after delivery				0.526
Exclusive breastfeeding	6 (50.0)	46 (66.7)	16 (61.5)	
Partial breastfeeding	6 (50.0)	23 (33.3)	10 (38.5)	
Changes in breastfeeding plan after delivery				0.051
Yes	2 (16.7)	8 (11.6)	9 (34.6)	
No	10 (83.3)	54 (78.3)	17 (65.4)	
No plan before delivery	-	7 (10.1)	-	
Reduction in breastfeeding frequency due to COVID-19 pandemic				0.725
Yes	1 (8.3)	4 (5.8)	2 (7.7)	
No	11 (91.7)	65 (94.2)	24 (92.3)	
Breastfeeding cessation due to COVID-19 pandemic				0.174
Yes	1 (8.3)	1 (1.4)	1 (3.8)	
No	11 (91.7)	68 (98.6)	25 (96.2)	

¹ National Recovery Plan.

² Includes mixed breastfeeding with formula milk or solid foods.

* Significant association at $p < 0.05$.

4.5 Comparison of Demographic Characteristics between Subjects who had Changed and not Changed in Breastfeeding Practices after Delivery during the COVID-19 Pandemic

The demographic characteristics were compared between 19 subjects who had changed their actual breastfeeding practices from the original feeding intention and 81 subjects who had not changed.

As tabulated in Table 4.3, the statistically significant associations were demonstrated between changes in breastfeeding practices with education level ($p = 0.009$) and total number of children ($p = 0.026$), respectively. Interestingly, the subjects who had changed their breastfeeding practices from the original intention were all with tertiary education level. Meanwhile, most of the subjects who had changed their breastfeeding practices had only one child (73.7%).

On the contrary, there was no association observed between the changes in breastfeeding practices and the other demographic characteristics which included maternal age, marital status, ethnicity, residence area, living region, youngest baby's age, and period of delivery, respectively ($p > 0.05$).

Table 4.4: Comparison of demographic characteristics between subjects who had changed and not changed in breastfeeding practices after delivery during the COVID-19 pandemic.

Characteristics	Had changed in breastfeeding practices	Not changed in breastfeeding practices	<i>p</i> -value
	(<i>n</i> = 19; 17.8%) <i>n</i> (%)	(<i>n</i> = 81; 75.7%) <i>n</i> (%)	
Age			0.186
≤ 25	-	5 (5.0)	
26 – 30	13 (68.4)	32 (45.0)	
31 – 35	5 (26.3)	31 (36.0)	
≥ 36	1 (5.3)	13 (14.0)	
Marital status			1.000
Single	-	-	
Married	19 (100)	80 (98.8)	
Other	-	1 (1.2)	
Ethnicity			0.334
Malay	1 (5.3)	5 (6.2)	
Chinese	15 (78.9)	70 (86.4)	
Indian	3 (15.8)	4 (4.9)	
Others	-	2 (2.5)	
Education level			0.009*
Primary	-	1 (1.2)	
Secondary	-	22 (27.2)	
Tertiary	19 (100)	58 (71.6)	
Household income (RM)			0.094
≤ 4000	3 (15.8)	26 (32.1)	
4001 – 8000	11 (57.9)	25 (30.9)	
≥ 8001	5 (26.3)	30 (37.0)	
Residence area			0.396
Urban	16 (84.2)	74 (91.4)	
Rural	3 (15.8)	7 (8.6)	
Living region			0.620
Central Region	10 (52.6)	38 (46.9)	
Southern Region	3 (15.8)	21 (25.9)	
Northern Region	4 (21.1)	9 (11.1)	
East Coast Region	2 (10.5)	12 (14.8)	
East Malaysia	-	1 (1.2)	
Total number of children			0.026*
1	14 (73.7)	32 (39.5)	
2	4 (21.1)	40 (49.4)	
≥ 3	1 (5.3)	9 (11.1)	

* Significant association at $p < 0.05$.

Table 4.4 (cont'd): Comparison of demographic characteristics between subjects who had changed and not changed in breastfeeding practices after delivery during the COVID-19 pandemic.

Characteristics	Had changed in breastfeeding practices	Not changed in breastfeeding practices	<i>p</i> -value
	<i>(n = 19; 17.8%)</i>	<i>(n = 81; 75.7%)</i>	
	<i>n (%)</i>	<i>n (%)</i>	
Youngest baby's age (In months)			0.280
0 – 6	9 (47.4)	21 (25.9)	
7 – 12	5 (26.3)	23 (28.4)	
13 – 18	3 (15.8)	25 (30.9)	
19 – 24	2 (10.5)	12 (14.8)	

* Significant association at $p < 0.05$.

4.6 Perceived Effects of COVID-19 Lockdown towards Subjects who had Changed and not Changed in Breastfeeding Practices after Delivery during the COVID-19 Pandemic

As tabulated in Table 4.4, no association was demonstrated between changes in breastfeeding practices with all perceived effects of COVID-19 lockdown ($p > 0.05$), which included “household crowding during lockdown”, “family stress from confinement”, “lack of family support in feeding baby”, “infant feeding support from health personnel”, “sufficient maternal health support”, and “contact with mothers-to-mothers breastfeeding support groups”.

In this study, majority of both subjects who had changed and not changed their breastfeeding practices from the original intention showed that they had “never” lack of family support in feeding baby. Furthermore, most of the subjects also claimed that they had “never” or only “sometimes” experienced household crowding, family stress from confinement, and received infant feeding support from the health personnel during the COVID-19 lockdown.

Table 4.5: Perceived effects of covid-19 lockdown towards subjects who had changed and not changed in breastfeeding practices after delivery during the COVID-19 pandemic.

Perceived effects of COVID-19 lockdown	Had changed in breastfeeding practices	Not changed in breastfeeding practices	<i>p</i> -value
	(<i>n</i> = 19; 17.8%) <i>n</i> (%)	(<i>n</i> = 81; 75.7%) <i>n</i> (%)	
Household crowding during lockdown			0.584
Never	9 (47.4)	35 (43.2)	
Sometimes	7 (36.8)	30 (37.0)	
Often	1 (5.3)	12 (14.8)	
Mostly	2 (10.5)	4 (4.9)	
Family stress from confinement			0.122
Never	10 (52.6)	34 (42.0)	
Sometimes	6 (31.6)	32 (39.5)	
Often	-	11 (13.6)	
Mostly	3 (15.8)	4 (4.9)	
Lack of family support in feeding baby			0.089
Never	13 (68.4)	39 (48.1)	
Sometimes	5 (26.3)	28 (34.6)	
Often	-	12 (16.0)	
Mostly	1 (5.3)	1 (1.2)	
Infant feeding support from health personnel			0.301
Never	12 (63.2)	31 (38.3)	
Sometimes	3 (15.8)	25 (30.9)	
Often	2 (10.5)	15 (18.5)	
Mostly	2 (10.5)	10 (12.3)	
Sufficient maternal health support			0.704
Never	4 (21.1)	14 (17.3)	
Sometimes	5 (26.3)	23 (28.4)	
Often	4 (21.1)	26 (32.1)	
Mostly	6 (31.6)	18 (22.2)	
Contact with mothers-to-mothers breastfeeding support groups			0.565
Never	2 (10.5)	16 (19.8)	
Sometimes	5 (26.3)	22 (27.2)	
Often	5 (26.3)	25 (30.9)	
Mostly	7 (36.8)	18 (22.2)	

4.7 Perception towards the Possible Reasons for Changing Breastfeeding Practices between Subjects who had Changed and not Changed in Breastfeeding Practices after Delivery during the Pandemic

As summarised in Table 4.5, the perceptions on insufficient milk ($p = 0.047$) and embarrassment ($p = 0.047$) were significantly associated with the changes in breastfeeding practices from the original intention during the COVID-19 pandemic.

In this study, majority of subjects who had changed their breastfeeding practices (42.1%) agreed that insufficient milk was the possible reason for changing breastfeeding practices from the initial feeding intention after delivery. Unexpectedly, all subjects who had changed their breastfeeding practices disagreed or strongly disagreed that embarrassment was a possible reason for changing breastfeeding practices, which accounted for 52.6% and 47.4%.

In contrast, the changes in breastfeeding practices were not associated with the perceptions on other possible reasons ($p > 0.05$), which included lack of face-to-face support, safety fears, positive for COVID-19 infection, exhaustion or stress, issue with latch or pain, partner not supportive, family not supportive, and working responsibility.

Table 4.6: Perception towards the possible reasons for changing breastfeeding practices between subjects who had changed and not changed in breastfeeding practices after delivery during the COVID-19 pandemic.

Possible reasons for changing breastfeeding practices during COVID-19 pandemic	Had changed in breastfeeding practices	Not changed in breastfeeding practices	<i>p</i> -value
	(<i>n</i> = 19; 17.8%) <i>n</i> (%)	(<i>n</i> = 81; 75.7%) <i>n</i> (%)	
Lack of face-to-face support			0.445
Strongly disagree	6 (31.6)	17 (21.0)	
Disagree	5 (26.3)	26 (32.1)	
Neutral	2 (10.5)	20 (24.7)	
Agree	5 (26.3)	16 (19.8)	
Strongly agree	1 (5.3)	2 (2.5)	
Safety fears			0.100
Strongly disagree	7 (36.8)	20 (24.7)	
Disagree	9 (47.4)	28 (34.6)	
Neutral	-	19 (23.5)	
Agree	2 (10.5)	10 (12.3)	
Strongly agree	1 (5.3)	4 (4.9)	
Positive for COVID-19 infection			0.287
Strongly disagree	8 (42.1)	24 (29.6)	
Disagree	6 (31.6)	18 (22.2)	
Neutral	2 (10.5)	18 (22.2)	
Agree	1 (5.3)	16 (19.8)	
Strongly agree	2 (10.5)	5 (6.2)	
Exhaustion/ stress			0.951
Strongly disagree	5 (26.3)	15 (18.5)	
Disagree	3 (15.8)	16 (19.8)	
Neutral	4 (21.1)	21 (25.9)	
Agree	5 (26.3)	21 (25.9)	
Strongly agree	2 (10.5)	8 (9.9)	
Issue with latch/ pain			0.860
Strongly disagree	5 (26.3)	15 (18.5)	
Disagree	3 (15.8)	19 (23.5)	
Neutral	5 (26.3)	18 (22.2)	
Agree	5 (26.3)	20 (24.7)	
Strongly agree	1 (5.3)	9 (11.1)	
Insufficient milk			0.047*
Strongly disagree	5 (26.3)	15 (18.5)	
Disagree	4 (21.1)	15 (18.5)	
Neutral	-	21 (25.9)	
Agree	8 (42.1)	18 (22.2)	
Strongly agree	2 (10.5)	12 (14.8)	

* Significant association at $p < 0.05$.

Table 4.6 (cont'd): Perception towards the possible reasons for changing breastfeeding practices between subjects who had changed and not changed in breastfeeding practices after delivery during the COVID-19 pandemic.

Possible reasons for changing breastfeeding practices during COVID-19 pandemic	Changed breastfeeding plan	Not changed in breastfeeding plan	<i>p</i> -value
	(<i>n</i> = 19; 17.8%)	(<i>n</i> = 81; 75.7%)	
	<i>n</i> (%)	<i>n</i> (%)	
Embarrassment			0.047*
Strongly disagree	9 (47.7)	25 (30.9)	
Disagree	10 (52.6)	30 (37.0)	
Neutral	-	19 (23.5)	
Agree	-	6 (7.4)	
Strongly agree	-	1 (1.2)	
Partner not supportive			0.657
Strongly disagree	8 (42.1)	27 (33.3)	
Disagree	7 (36.8)	23 (28.4)	
Neutral	2 (10.5)	18 (22.2)	
Agree	2 (10.5)	8 (9.9)	
Strongly agree	-	5 (6.2)	
Family not supportive			0.738
Strongly disagree	7 (36.8)	25 (30.9)	
Disagree	8 (42.1)	25 (30.9)	
Neutral	2 (10.5)	17 (21.0)	
Agree	2 (10.5)	10 (12.3)	
Strongly agree	-	4 (4.9)	
Working responsibility			0.380
Strongly disagree	6 (31.6)	14 (17.3)	
Disagree	2 (10.5)	19 (23.5)	
Neutral	5 (26.3)	29 (35.8)	
Agree	5 (26.3)	13 (16.0)	
Strongly agree	1 (5.3)	6 (7.4)	

* Significant association at $p < 0.05$.

CHAPTER 5

DISCUSSION

5.1 Infant Feeding Practices and Changes in Breastfeeding Practices during the COVID-19 Pandemic

In this study, the actual breastfeeding practices for the first six months of babies had moderately changed (17.8%) from the mothers' feeding intention before giving birth, in which the percentage of exclusive breastfeeding was slightly decreased (4.6%) while the partial breastfeeding was moderately increased (12.1%) from the initial breastfeeding intention. These findings were similar to the findings by Vazquez-Vazquez et al. (2021) in UK, which reported 13% changes in the breastfeeding practices during the COVID-19 lockdown. In contrast, these findings were not consistent with the earlier studies in Italy (30%), in China (28%) and in Thailand (4.32%) (Latorre et al., 2021; Piankusol et al., 2021; Yu et al., 2022).

By comparing the reduction rates in breastfeeding frequency and duration due to COVID-19 pandemic, the current findings (6.5%; 2.8%) were also inconsistent with the results reported in UK (10%; 15%) and in Thailand (1.44%; 0.44%) (Vazquez-Vazquez et al., 2021; Piankusol et al., 2021).

The inconsistent findings might be due to the differences in social awareness among different countries or different periods of study with incomparable COVID-19 situations (Piankusol et al., 2021).

5.2 Association of Infant Feeding Practices and Changes with the Periods of Delivery during the COVID-19 pandemic

A significant association ($p = 0.002$) between infant feeding intention and the periods of delivery before, during, and after MCOs was shown in this study. Mothers who gave birth after MCO or during NRP (84.6%) was more prone to exclusively breastfeed their baby from 0 to 6 months, whereas mothers who delivered before MCO (66.7%) was more prone to partially breastfeed their babies. Meanwhile, all mothers with no feeding plan (10.1%) before delivery were observed in the groups gave birth during MCOs. These findings were different with the previous findings in China, which reported no association between feeding intention before delivery and periods of delivery (Yu et al., 2022). The association in the current study could be explained by the fluctuation of stress levels in terms of financial resources and family factors with different periods of MCO (Vaughn et al., 2010).

Furthermore, the changes in actual breastfeeding practices from the initial feeding intention indicated a strong tendency ($p = 0.051$) to be associated with the periods of delivery. However, there was no association ($p > 0.05$) between breastfeeding practices for the first six months of babies after delivery and the periods of delivery in this study. On the contrary, the findings in China demonstrated that the changes in actual feeding from the feeding intention and infant feeding at the first six months of life were significantly associated ($p < 0.05$) with the periods of delivery (Yu et al., 2022).

In the current study, mothers who gave birth after MCO period (34.6%) were marginally more prone to change their breastfeeding practices compared to

those gave birth before (16.7%) and during (11.6%) MCO periods. This might be because the mothers' decision on breastfeeding practices was not affected prior to the first MCO. Subsequently, the restriction measures may allow mothers to spend more time at home, making them less likely to change their breastfeeding practices (Yu et al., 2022). As a result of transformation of MCOs into NRP, mothers would feel difficult to adapt to the recovery of most economic activities and therefore changed their breastfeeding practices from the feeding intention (Mahbob, 2021).

5.3 Association between Demographic Characteristics and Changes in Breastfeeding Practices during the COVID-19 Pandemic

In contrast to Piankusol et al. (2021) who demonstrated that none of the maternal characteristics was significantly associated with the changes of breastfeeding practices in Thailand, the current study revealed that the changes in breastfeeding practices were significantly dependent on the maternal education level ($p = 0.009$) and the total number of children ($p = 0.026$).

In this study, the mothers with tertiary education level were more likely to change their breastfeeding practices than those with primary or secondary education level. As reported in the earlier studies, mothers with higher education level would have higher tendency of breastfeeding compared to those with lower education level (Hendricks et al., 2006; Okafor et al., 2013; Topothai et al., 2021). However, mothers with tertiary education level might be busy with works and have insufficient time to exclusively breastfeed, therefore they were more likely to change their breastfeeding practices than those with primary and secondary education level (Adnan and Muniandy, 2012; Ngandu et al., 2020).

Furthermore, mothers with only one child were prone to change their breastfeeding practices from the initial feeding intention as observed in this study. This finding was in agreement with Whalen and Cramton (2010) and Moraes de Oliveira and Camelo (2017), which claimed that primiparous mothers were less likely to exclusively breastfeed their babies compared to the multiparous mothers. First-time mothers were less confident to breastfeed their babies because they had no previous experience (Whalen and Cramton, 2010; Mundagowa et al., 2019). As a result of COVID-19 pandemic, the confidence of first-time mothers to exclusively breastfeed could be reduced because they might be more difficult to seek helps from the professionals.

Apart from that, the current findings indicated that there was no association between the changes in breastfeeding practices and the other demographic characteristics which included maternal age, marital status, ethnicity, residence area, living region, youngest baby's age, and period of delivery, respectively ($p > 0.05$). This was not consistent with the findings by Yu et al. (2022) in China, which reported a significant association between maternal age and changes in actual feeding practices from the feeding intention. Meanwhile, the current findings also contradicted the findings by Shohaimi et al. (2022) in Malaysia, which demonstrated that the breastfeeding practices were strongly associated with the ethnicity. These inconsistent findings might be attributed to the social and cultural variables, thereby it was critical to include these considerations in the interventions of promoting breastfeeding (Yu et al., 2022). Another main reason for no associations between changes in breastfeeding practices and

demographic characteristic is the proportion of ethnicities of the participants of this study which is dominated by mostly Chinese.

5.4 Association between Perceived Effects of COVID-19 Lockdown and Changes in Breastfeeding Practices during the COVID-19 Pandemic

Although MCOs had brought several impacts towards our daily life, current study proposed that all perceived effects of COVID-19 lockdown were not associated with the changes of breastfeeding practices during the pandemic. On the contrary, previous findings have demonstrated strong associations between the changes in breastfeeding practices and the perceived effects which included “lack of family support in feeding baby”, “infant feeding support from health personnel”, and “sufficient maternal health support” (Brown and Shenker, 2021; Piankusol et al., 2021; Vazquez-Vazquez et al., 2021). In another study, a significant association was indicated between the breastfeeding practices and the mothers-to-mothers breastfeeding support groups (Tang et al., 2019).

In this study, most of the mothers revealed that they had never lack of family support during the MCO periods, disregard whether they had changed or not changed their breastfeeding practices. Moreover, most of them also revealed that they had “never” or only “sometimes” experienced household crowding, family stress from confinement, and received infant feeding support from the health personnel during the COVID-19 lockdown. The similar findings were shown by Yu et al. (2022) in China, which reported that both mothers who delivered before and during lockdown had received adequate support in the breastfeeding practices.

As a culture in Malaysian families, notably Chinese and Indian, the parent-adult child living arrangements generates a strong social and economic connections within the families. Therefore, it is easier for Malaysian mothers to receive infant feeding support from their mothers or mothers-in-law due to the extended family household patterns, in which the married adults may live together with their parents or near to their parents (DaVanzo and Chan, 1994).

In addition, majority of Malaysian mothers who had changed or not changed their breastfeeding practices reported that they had never or rarely receive infant feeding support from the health personnel during the COVID-19 lockdown. Despite the services provided by the health personnel, Malaysian mothers were less likely to seek helps from the clinical settings as they did not have any pathological disorders or diseases that required treatment (Tajuddin et al., 2020). Besides, privacy and embarrassment could be the reasons that kept mothers away from the health personnel. Mothers might feel uncomfortable to expose themselves to the strangers, such as the healthcare staffs (Jarrar et al., 2018).

Furthermore, the frequency of contact with mothers-to-mothers breastfeeding support groups during lockdown varied from “never” to “mostly” and showed not much difference between mothers who had changed or not changed their breastfeeding practices in this study. Online social support groups such as mothers-to-mothers breastfeeding support groups are established to give informational, esteem, and emotional supports to the mothers (Wagg et al., 2019). The support groups are platforms for mothers to interact and share experiences with each other (Neal, 2013). Nevertheless, the misinformation or

negative judgement could be spread if the groups are not regulated by the trained peer supporters (Dornan and Oermann, 2006). Therefore, the decision of joining the online social support groups is subjective among mothers.

5.5 Association between Perception towards Possible Reasons of Changing Breastfeeding Practices and Changes in Breastfeeding Practices during the COVID-19 Pandemic

In line with Brown and Shenker (2021) and Vazquez-Vazquez et al. (2021), the current study agreed that perceptions of insufficient milk ($p = 0.047$) and embarrassment ($p = 0.047$) were significantly associated with the changes of breastfeeding practices.

In this study, majority Malaysian mothers who had changed their breastfeeding practices predominantly agreed that insufficient milk was one of the reasons to change their breastfeeding practices. This corresponded to previous studies which reported that the mothers' perception on inadequate milk supply was commonly identified as a barrier to exclusive breastfeeding (Nuzrina et al., 2016; Jama et al., 2017). De Roza et al. (2019) reported that the perceived insufficient milk supply was negatively correlated with the maternal breastfeeding self-efficacy, in which mothers with lower breastfeeding self-efficacy would not believe that they could produce sufficient breast milk to feed their babies.

Additionally, the mothers' perception of insufficient breast milk is driven by the baby's reflection of crying and suckling. The signs of satiation will be shown by the babies with effective suckling, while the babies with ineffective sucking will cry and become irritated (Newman and Pitman, 2015). Gatti (2008)

proposed that the satisfaction signals are noticed by many mothers as the primary indicator of milk supply, but they never undergo the evaluation of actual milk supply. However, crying might be indicative of a variety of unmet requirements such as physical discomfort and sleepiness, instead of being hungry (Mohebati, 2021). Apart from the perceived insufficient milk supply, some of the mothers might experience actual milk supply deficiency due to factors which included pathological abnormalities, caesarean section, late initiation of breastfeeding, and ineffective suckling by infants (Hill et al., 2007; Kent et al., 2012; Hobbs et al., 2016).

In order to improve the exclusive breastfeeding rates, the maternal perception of insufficient milk supply must be addressed. In order to strengthen the breastfeeding self-efficacy of mothers, the breastfeeding knowledge should be delivered to mothers as well as their family members during prenatal period (Huang, 2022). For instance, mothers should understand the basic physiology of breast milk secretion, proper breastfeeding techniques, normal patterns of baby breastfeeding behaviour and ways to overcome breastfeeding difficulties (Safon et al., 2017; Rodrigo, 2018; Demirci et al., 2020). Furthermore, mothers must also learn to recognize the infant's signals for feeding, including increased alertness, rooting reflex, moving the lips or tongue, and sucking on the finger or fist (Huang, 2022). The actual milk supply should also be examined via more reliable parameters, such as the frequencies of wet nappies, infant alertness, infant growth and weight gain (Kent et al., 2021).

Moreover, the association between the perception of embarrassment and the changes of breastfeeding practices was found in this study. Surprisingly, all mothers who had changed their breastfeeding practices from the initial feeding intention disagreed or strongly disagreed that embarrassment could act as the possible reason of changing breastfeeding practices. The perceptions of embarrassment towards breastfeeding vary across religions, cultures, and geographical locations (Komodiki et al., 2014). Some mothers felt that breastfeeding was a natural part of being a mother, but others struggled to do so in public as they worried about the social disapproval owing to the sexualisation of the breasts (Grant, 2016; Zhao et al., 2018). In some cases, although mothers believed that others would understand and support their breastfeeding effort, they still feel embarrassed to practice breastfeeding in front of others, especially among male friends or colleagues (Ismail et al., 2012). As a result of MCOs or NRP in Malaysia, embarrassment was less likely to be the reason of changing breastfeeding practices because mothers were less exposed to public and had to maintain social distancing with others.

5.6 Limitations of Study and Future Work

Since this survey was conducted online by using the convenient sampling method and given a short period of study, the results might be biased and did not represent the whole population of mothers with babies aged 0 – 24 months in Malaysia due to the small and limited sample size. Besides, mothers who lived in rural areas with poor internet connection would not be able to access this survey. Apart from that, the ethnicity of the subjects was predominantly Chinese, thereby this study may not represent the actual ethnicity composition in

Malaysia. Furthermore, this study may be subjected to the recall and social desirability bias because the questionnaire was self-administrated by the subjects. Moreover, the questionnaire was only in English, thereby it was only limited to subjects who can read English.

In addition, the recruitment of breastfeeding mothers in this study was mainly from the breastfeeding groups on social media such as Facebook, but not from hospitals. Therefore, this study was only focused on Malaysian mothers who breastfeed their babies, excluding those with formula feeding. Consequently, the prevalence of exclusive breastfeeding during the COVID-19 pandemic could not be predicted in this study and compared to the prevalence prior to the pandemic.

Progressing from the present study, more cross-sectional studies can be conducted in a combination of online and offline for a longer period of study. The questionnaire can be made more accessible to subjects from both urban and rural areas by posting it on the online social media including Facebook and WhatsApp, as well as distributing it via traditional media such as the newspapers. Likewise, the questionnaire can be prepared in multi-language such as Malay, Mandarin, and Tamil, to target more subjects without English language proficiency. A larger sample size can be obtained to improve the accuracy and reliability of the epidemiologic information.

In addition, the researchers could cooperate with hospitals and clinics in order to approach both non-breastfeeding and breastfeeding mothers. Therefore, the

prevalence of exclusive breastfeeding during pandemic could be reported and used to compare with the prevalence before pandemic. In order to explore more maternal experiences in detail, a survey via interview through telephone calls can be further carried out based on the self-administrated questionnaire, with the agreement of the subjects.

CHAPTER 6

CONCLUSION

Generally, the present study has reported 17.8% of changes in the actual breastfeeding practices for the first six months of babies after delivery from the breastfeeding intention among Malaysian mothers, in which the rate of exclusive breastfeeding was slightly decreased (4.6%) while the partial breastfeeding was moderately increased (12.1%) from the initial breastfeeding intention. The feeding intention before delivery was significant associated with the periods of delivery ($p = 0.002$). Meanwhile, changes in actual breastfeeding practices had strong tendency to be significantly associated ($p = 0.051$) with the delivery periods of before, during, or after MCOs. In contrast, the actual breastfeeding practices for the first six months of baby after delivery, decrease in breastfeeding frequency and breastfeeding cessation were not associated to the periods of birth ($p > 0.05$).

Demographic analysis in this study also revealed a significant relationship between the maternal education level ($p = 0.007$) and total number of children ($p = 0.026$) with the changes of actual breastfeeding practices from the initial plan. However, the changes in breastfeeding practices were not associated with other demographic characteristics which included maternal age, marital status, ethnicity, residence area, living region, youngest baby's age, and period of delivery, respectively ($p > 0.05$).

Furthermore, there was no statistical significance ($p > 0.05$) between changes in breastfeeding practices and all perceived effects of COVID-19 lockdown, which included “household crowding during lockdown”, “family stress from confinement”, “lack of family support in feeding baby”, “infant feeding support from health personnel”, “sufficient maternal health support”, and “contact with mothers-to-mothers breastfeeding support groups”.

In terms of perceptions on the possible reasons of changing breastfeeding practices, the current study indicated significant associations between the changes of actual breastfeeding practices with insufficient milk ($p = 0.047$) and embarrassment ($p = 0.047$), respectively. In contrast, no association ($p > 0.005$) was demonstrated between changes in breastfeeding practices and other possible reasons, which included lack of face-to-face support, safety fears, positive for COVID-19 infection, exhaustion or stress, issue with latch or pain, partner not supportive, family not supportive, and working responsibility.

The current findings can be used as a reference by the Ministry of Health (Malaysia) in the action of recovering the reduction of exclusive breastfeeding caused by the COVID-19 pandemic. The breastfeeding-promoting interventions should be focused on the aspects which were significantly associated with the changes in breastfeeding practices as observed in this study.

REFERENCES

- Adnan, N. and Muniandy, N.D. (2012). The relationship between mothers' educational level and feeding practices among children in selected kindergartens in Selangor, Malaysia: A cross-sectional study. *Asian Journal of Clinical Nutrition*, 4(2), pp.39–52.
- Agnarsson, I., Mpello, A., Gunnlaugsson, G., Hofvander, Y. and Greiner, T., 2001. Infant feeding practices during the first six month of life in the rural areas of Tanzania. *East African Medical Journal*, 78(1), pp. 9–13.
- Agunbiade, O.M. and Ogunleye, O.V., 2012. Constraints to exclusive breastfeeding practice among breastfeeding mothers in Southwest Nigeria: implications for scaling up. *International Breastfeeding Journal*, 7(5), pp. 1–10.
- Alsaweed, M., Hartmann, P.E., Geddes, D.T. and Kakulas, F., 2015. MicroRNAs in breastmilk and the lactating breast: potential immunoprotectors and developmental regulators for the infant and the mother. *International Journal of Environmental Research and Public Health*, 12(1), pp. 3981–4020.
- Amir, L.H., 2006. Breastfeeding--managing "supply" difficulties. *Australian Family Physician*, 35(9), pp. 686–689.
- Arora, S., McJunkin, C., Wehrer, J. and Kuhn, P., 2000. Major factors influencing breastfeeding rates: mother's perception of father's attitude and milk supply. *Pediatrics*, 106(5), pp. e67–e67.
- Arumugam, T., 2021. *MCO, CMCO, RMCO: dos and don'ts* [online]. Available at: <https://www.nst.com.my/news/nation/2021/01/656469/mco-cmco-rmco-dos-and-donts> [Accessed: 05 February 2022].
- Asnicar, F. et al., 2017. Studying vertical microbiome transmission from mothers to infants by strain-level metagenomic profiling. *mSystems*, 2(1), pp. 1–20.
- Ballard, O. and Morrow, A.L., 2013. Human milk composition. *Pediatric Clinics of North America*, 60(1), pp. 49–74.
- Balogun, O.O., Dagvadorj, A., Anigo, K.M., Ota, E. and Sasaki, S., 2015. Factors influencing breastfeeding exclusivity during the first 6 months of life in developing countries: a quantitative and qualitative systematic review. *Maternal and Child Nutrition*, 11(4), pp. 433–451.
- Barennes, H. et al., 2012. Breast-milk substitutes: a new old-threat for breastfeeding policy in developing countries. A case study in a traditionally high

breastfeeding country. *Plos One*, 7(2), p. e30634.

Boquien, C.Y., 2018. Human milk: an ideal food for nutrition of preterm newborn. *Frontiers in Pediatrics*, 6(295), pp. 1–9.

Brown, A. and Shenker, N., 2021. Experiences of breastfeeding during COVID-19: Lessons for future practical and emotional support. *Maternal and Child Nutrition*, 17(1), pp. 1–15.

Castellote, C. et al., 2011. Premature delivery influences the immunological composition of colostrum and transitional and mature human milk. *The Journal of Nutrition*, 141(6), pp. 1181–1187.

Castillo-Castañeda, P.C. et al., 2019. Micronutrient content and antioxidant enzyme activities in human breast milk. *Journal of Trace Elements in Medicine and Biology*, 51, pp. 36–41.

Centers for Disease Control and Prevention (CDC), 2021. *Vitamin D* [online]. Available at: <https://www.cdc.gov/breastfeeding/breastfeeding-special-circumstances/diet-and-micronutrients/vitamin-d.html> [Accessed: 26 May 2022].

Cucinotta, D. and Vanelli, M., 2020. WHO declares covid-19 a pandemic. *Acta bio-medica: Atenei Parmensis*, 91(1), pp. 157–160.

DaVanzo, J., and Chan, A., 1994. Living arrangements of older Malaysians: who coresides with their adult children? *Demography*, 31, pp. 95–113.

Dearden, K.A. et al., 2002. Work outside the home is the primary barrier to exclusive breastfeeding in rural Viet Nam: insights from mothers who exclusively breastfed and worked. *Food and Nutrition Bulletin*, 23(4), pp. 101–108.

Demirci, J.R. et al., 2020. The development and evaluation of a text message program to prevent perceived insufficient milk among first-time mothers: Retrospective analysis of a randomized controlled trial. *JMIR mHealth and uHealth*, 8(4), e17328.

Dennis, C.L., 2002. Breastfeeding initiation and duration: a 1990-2000 literature review. *Journal of Obstetric, Gynecologic and Neonatal Nursing*, 31(1), pp. 12–32.

De Roza, J.G. et al., 2019. Exclusive breastfeeding, breastfeeding self-efficacy and perception of milk supply among mothers in Singapore: A longitudinal study. *Midwifery*, 79, e102532.

Dewey, K.G., Heinig, M.J. and Nommsen-Rivers, L.A., 1995. Differences in morbidity between breast-fed and formula-fed infants. *The Journal of Pediatrics*, 126(5), pp. 696–702.

Diji, A.K. et al., 2017. Challenges and predictors of exclusive breastfeeding among mothers attending the child welfare clinic at a regional hospital in Ghana: a descriptive cross-sectional study. *International Breastfeeding Journal*, 12(13), pp. 1–7.

Dornan, B.A. and Oermann, M.H., 2006. Evaluation of breastfeeding web sites for patient education. *MCN. The American Journal of Maternal/Child Nursing*, 31(1), pp. 18–23.

Duong, D.V., Lee, A.H. and Binns, C.W., 2005. Determinants of breast-feeding within the first 6 months post-partum in rural Vietnam. *Journal of Paediatrics and Child Health*, 41(7), pp. 338–343.

Ganasegeran, K., Ch'ng, A.S.H. and Looi, I., 2020. COVID-19 in Malaysia: Crucial measures in critical times. *Journal of Global Health*, 10(2), pp. 1–4.

Garwolińska, D., Namieśnik, J., Kot-Wasik, A. and Hewelt-Belka, W., 2018. Chemistry of human breast milk—a comprehensive review of the composition and role of milk metabolites in child development. *Journal of Agricultural and Food Chemistry*, 66, pp. 11881–11896.

Gatti, L., 2008. Maternal perceptions of insufficient milk supply in breastfeeding. *Journal of Nursing Scholarship*, 40(4), pp. 355–363.

Gibson, M.E., 2005. Getting back to basics. *AJN, American Journal of Nursing*, 105(10), pp. 72–73.

Godfrey, J.R. and Lawrence, R.A., 2010. Toward optimal health: the maternal benefits of breastfeeding. *Journal of Women's Health*, 19(9), pp. 1597–1602.

Grant, A., 2016. “I...don’t want to see you flashing your bits around”: exhibitionism, othering and good motherhood in perceptions of public breastfeeding. *Geoforum*, 71, pp. 52–61.

Guo M., 2014. *Human milk biochemistry and infant formula manufacturing technology*. Cambridge: Elsevier.

Hawkins, S.S., Griffiths, L.J., Dezateux, C. and Law, C., 2007. Maternal employment and breast-feeding initiation: findings from the Millennium Cohort Study. *Paediatric and Perinatal Epidemiology*, 21(3), pp. 242–247.

Hawley, N.L. et al., 2015. Mothers’ attitudes and beliefs about infant feeding

highlight barriers to exclusive breastfeeding in American Samoa. *Women and Birth: Journal of the Australian College of Midwives*, 28(3), pp. e80–e86.

Heinig, M.J. and Dewey, K.G., 1996. Health advantages of breast feeding for infants: a critical review. *Nutrition Research Reviews*, 9(01), pp. 89–110.

Hendricks, K., Briefel, R., Novak, T. and Ziegler, P., 2006. Maternal and child characteristics associated with infant and toddler feeding practices. *Journal of the American Dietetic Association*, 106(1), pp.135–148.

Hill, P. D., Aldag, J. C., Zinaman, M. and Chatterton, R.T., 2007. Predictors of preterm infant feeding methods and perceived insufficient milk supply at week 12 postpartum. *Journal of Human Lactation*, 23(1), pp. 39–43.

Hinsliff-Smith, K., Spencer, R. and Walsh, D., 2014. Realities, difficulties, and outcomes for mothers choosing to breastfeed: Primigravid mothers experiences in the early postpartum period (6–8 weeks). *Midwifery*, 30(1), pp. e14–e19.

Hobbs, A.J., Mannion, C.A., Mcdonald, S.W., Brockway, M. and Tough, S.C., 2016. The impact of caesarean section on breastfeeding initiation, duration and difficulties in the first four months postpartum. *BMC Pregnancy and Childbirth*, 16(1), pp. 1–9.

Horta, B.L., Loret de Mola, C. and Victora, C.G., 2015. Long-term consequences of breastfeeding on cholesterol, obesity, systolic blood pressure and type 2 diabetes: a systematic review and meta-analysis. *Acta Paediatrica*, 104(467), pp. 30–37.

Horwood, L.J., 2001. Breast milk feeding and cognitive ability at 7-8 years. *Archives of Disease in Childhood - Fetal and Neonatal Edition*, 84(1), pp. 23F27.

Hossain, M.M., Radwan, M.M., Arafa, S.A., Habib, M. and DuPont, H.L., 1992. Prolactal infant feeding practices in rural egypt. *Journal of Tropical Pediatrics*, 38(6), pp. 317–322.

Huang, Y., Liu, Y., Yu, X. and Zeng, T., 2022. The rates and factors of perceived insufficient milk supply: A systematic review. *Maternal and Child Nutrition*, 18(1), p. e13255.

Ibrahim, S.H., Abd El –Ghany, S.M., El Shafie, T.M. and El Hady, M., 2019. Cognitive functions in breastfed versus artificially fed in preschool children. *The Egyptian Journal of Hospital Medicine*, 77(5), pp. 5742–5751.

Ip, S. et al., 2007. *Breastfeeding and Maternal and Infant Health Outcomes in Developed Countries*. Rockville, MD: Agency for Healthcare Research and Quality (US).

Ismail, T.A.T., Sulaiman, Z., Jalil, R., Wan Muda, W.M. and Nik Man, N.N., 2012. Breast milk expression among formally employed women in urban and rural Malaysia: A qualitative study. *International Breastfeeding Journal*, 7(1), p. 11.

Jama, N.A. et al., 2017. Enablers and barriers to success among mothers planning to exclusively breastfeed for six months: a qualitative prospective cohort study in KwaZulu-Natal, South Africa. *International Breastfeeding Journal*, 12(43), pp. 1–13.

Jarrar, M. et al., 2018. Nursing duty hours' length and the perceived outcomes of care. *Global Journal of Health Science*, 10(4), pp. 1–6.

Jayaraj, V.J., Rampal, S., Ng, C.-W. and Chong, D.W.Q., 2021. The epidemiology of COVID-19 in Malaysia. *The Lancet Regional Health - Western Pacific*, 17, pp. 1–10.

Johnston, M.L. and Esposito, N., 2007. Barriers and facilitators for breastfeeding among working women in the United States. *Journal of Obstetric, Gynecologic and Neonatal Nursing*, 36(1), pp. 9–20.

Jost, T., Lacroix, C., Braegger, C.P., Rochat, F. and Chassard, C., 2014. Vertical mother-neonate transfer of maternal gut bacteria via breastfeeding. *Environmental Microbiology*, 16(9), pp. 2891–2904.

Karande, S. and Perkar, S., 2012. Do fathers' attitudes support breastfeeding? a cross-sectional questionnaire-based study in Mumbai, India. *Indian Journal of Medical Sciences*, 66(1), pp. 30–39.

Karmaus, W., Soto-Ramírez, N. and Zhang, H., 2017. Infant feeding pattern in the first six months of age in USA: a follow-up study. *International Breastfeeding Journal*, 12(48), pp. 1–11.

Kementerian Kesihatan Malaysia (KKM), 2021a, *Baby friendly hospital initiative* [online]. Available at: <https://nutrition.moh.gov.my/en/inisiatif-hospital-rakan-bayi-bfhi/> [Accessed: 04 March 2022].

Kementerian Kesihatan Malaysia (KKM), 2021b, *Breastfeeding promotion* [online]. Available at: <https://nutrition.moh.gov.my/en/promosi-penyusuan-susu-ibu/> [Accessed: 04 March 2022].

Kent, J.C., Prime, D.K. and Garbin, C.P., 2012. Principles for maintaining or increasing breast milk production. *Journal of Obstetric Gynecologic and Neonatal Nursing*, 41(1), pp. 114–121.

Kent, J.C. et al., 2021. Causes of perception of insufficient milk supply in Western Australian mothers. *Maternal and Child Nutrition*, 17(1), p. e13080.

Kim, H.Y., 2017. Statistical notes for clinical researchers: Chi-squared test and Fisher's exact test. *Restorative Dentistry and Endodontics*, 42(2), pp. 152–155.

Kim, M.H. et al., 2019. Macronutrient analysis of human milk according to storage and processing in Korean mother. *Pediatric Gastroenterology, Hepatology & Nutrition*, 22(3), p.262.

Kim, S.Y. and Yi, D.Y., 2020. Components of human breast milk: from macronutrient to microbiome and microRNA. *Clinical and Experimental Pediatrics*, 63(8), pp. 301–309.

Kimbrow, R.T., 2006. On-the-job moms: work and breastfeeding initiation and duration for a sample of low-income women. *Maternal and Child Health Journal*, 10(1), pp. 19–26.

Klopp, A. et al., 2017. Modes of infant feeding and the risk of childhood asthma: a prospective birth cohort study. *The Journal of Pediatrics*, 190, pp. 192-199.e2.

Komodiki, E. et al., 2014 Breastfeeding in public: a global review of different attitudes towards it. *Journal of Pediatrics and Neonatal Care*, 1(6), pp. 1–4.

Ku, C.M. and Chow, S.K., 2010. Factors influencing the practice of exclusive breastfeeding among Hong Kong Chinese women: a questionnaire survey. *Journal of Clinical Nursing*, 19(17-18), pp. 2434–2445.

Kulski, J. K. and Hartmann, P.E., 1981. Changes in human milk composition during the initiation of lactation. *The Australian Journal of Experimental Biology and Medical Science*, 59(1), pp. 101–114.

Kunz, C., Rodriguez-Palmero, M., Koletzko, B. and Jensen, R., 1999. Nutritional and biochemical properties of human milk, part I: general aspects, proteins, and carbohydrates. *Clinics in Perinatology*, 26(2), pp. 307–333.

Lai, C.C., Shih, T.P., Ko, W.C., Tang, H.J. and Hsueh, P.R., 2020. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. *International Journal of Antimicrobial Agents*, 55(3), p. 105924.

Latorre, G. et al., 2021. Impact of COVID-19 pandemic lockdown on exclusive breastfeeding in non-infected mothers. *International Breastfeeding Journal*, 16(36), pp. 1–7.

Leung, A.K.C. and Sauve, R.S., 2005. Breast is best for babies. *Journal of the National Medical Association*, 97(7), pp. 1010–1019.

Lim, A., 2002. *The six regions of Malaysia* [online]. Available at:

<http://thingsasian.com/story/six-regions-malaysia> [Accessed: 16 February 2022].

Ludvigsson, J.F. and Ludvigsson, J., 2005. Socio-economic determinants, maternal smoking and coffee consumption, and exclusive breastfeeding in 10205 children. *Acta Paediatrica*, 94(9), pp. 1310–1319.

Mahbob, S., 2021. *NRP a reset strategy for economy* [online]. Available at: <https://www.nst.com.my/opinion/columnists/2021/06/699782/nrp-reset-strategy-economy> [Accessed: 15 April 2022].

Martin, C., Ling, P.R. and Blackburn, G., 2016. Review of infant feeding: key features of breast milk and infant formula. *Nutrients*, 8(5), p. 279.

McCann, M.F., Baydar, N. and Williams, R.L., 2007. Breastfeeding attitudes and reported problems in a national sample of wic participants. *Journal of Human Lactation: Official Journal of International Lactation Consultant Association*, 23(4), pp. 314–324.

Melnik, B.C. and Schmitz, G., 2017. MicroRNAs: milk's epigenetic regulators. *Best Practice and Research. Clinical Endocrinology and Metabolism*, 31(4), pp. 427–442.

Michaelsen, K.F., Skafté, L., Badsberg, J.H. and Jorgensen, M., 1990. Variation in macronutrients in human bank milk: influencing factors and implications for human milk banking. *Journal of Pediatric Gastroenterology and Nutrition*, 11, pp. 229–239.

Ministry of Health (MOH), Malaysia, 2021. *COVID-19 Public/Epidemic/Cases_Malaysia* [online]. Available at: https://github.com/MoH-Malaysia/covid19-public/blob/main/epidemic/cases_malaysia.csv [Accessed: 30 January 2022].

Mohebati, L.M. et al., 2021. Perceived insufficient milk among primiparous, fully breastfeeding women: Is infant crying important? *Maternal and Child Nutrition*, 17, e13133.

Moore, E.R., Anderson, G.C. and Bergman, N., 2007. Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database of Systematic Reviews*, 11(11), pp. 1–125.

Moraes de Oliveira, M. and Camelo, J.S., 2017. Gestational, perinatal, and postnatal factors that interfere with practice of exclusive breastfeeding by six months after birth. *International Breastfeeding Journal*, 12(42), pp. 1–9.

Mosquera, P.S. et al., 2019. Factors affecting exclusive breastfeeding in the first month of life among Amazonian children. *PloS One*, 14(7), p. e0219801.

Muchacha, M. and Mtetwa, E., 2015. Social and economic barriers to exclusive breast feeding in rural zimbabwe. *International journal of MCH and AIDS*, 3(1), pp. 16–21.

Mundagowa, P.T., Chadambuka, E.M., Chimberengwa, P.T. and Mukora-Mutseyekwa, F., 2019. Determinants of exclusive breastfeeding among mothers of infants aged 6 to 12 months in Gwanda District, Zimbabwe. *International Breastfeeding Journal*, 14(30), pp. 1–8.

Murphy, K. et al., 2017. The composition of human milk and infant faecal microbiota over the first three months of life: a pilot study. *Scientific Reports*, 7, p. 40597.

Nabulsi, M., 2011. Why are breastfeeding rates low in Lebanon? a qualitative study. *BMC Pediatrics*, 11(1), pp. 1–6.

Nawaz, R., Ur Rehman, S., Nawaz, S. and Mohammad, T., 2009. Factors causing non-breastfeeding in children under six months of age in district Nowshera, Pakistan. *Journal of Ayub Medical College, Abbottabad: JAMC*, 21(4), pp. 93–95.

Neal, Z.P., 2013. *The connected city how networks are shaping the modern metropolis*, 1st ed. New York: Routledge.

Newman, J. and Pitman, T., 2015. *Dr. Jack Newman's guide to breastfeeding*. Canada: Pinter and Martin Ltd.

Ngandu, C.B. et al., 2020. The association between household socio-economic status, maternal socio-demographic characteristics and adverse birth and infant growth outcomes in sub-Saharan Africa: a systematic review. *Journal of Developmental Origins of Health and Disease*, 11(4), pp. 317–334.

Nutrition Division, Ministry of Health, Malaysia, 2016. *National Plan of Action for Nutrition of Malaysia III 2016-2025*. Putrajaya: National Coordinating Committee on Food and Nutrition (NCCFN).

Nuzrina, R., Roshita, A. and Basuki, D.N., 2016. Factors affecting breastfeeding intention and its continuation among urban mothers in West Jakarta: a follow-up qualitative study using critical point contact for breastfeeding. *Asia Pacific Journal of Clinical Nutrition*, 25(Suppl 1), pp. 43–51.

Okafor, I., Olatona, F. and Olufemi, O., 2013. Breastfeeding practices of mothers of young children in Lagos, Nigeria. *Nigerian Journal of Paediatrics*, 41(1), p. 43.

Otoo, G.E., Lartey, A.A. and Pérez-Escamilla, R., 2009. Perceived incentives and barriers to exclusive breastfeeding among periurban ghanaiian women.

Journal of Human Lactation, 25(1), pp. 34–41.

Patil, D.S. et al., 2020. A mixed-methods systematic review on barriers to exclusive breastfeeding. *Nutrition and Health*, 26(4), pp. 323–346.

Piankusol, C., Sirikul, W., Ongprasert, K. and Siviroj, P., 2021. Factors affecting breastfeeding practices under lockdown during the COVID-19 pandemic in Thailand: a cross-sectional survey. *International Journal of Environmental Research and Public Health*, 18(16), p. 8729.

Picciano M. F., 2001. Nutrient composition of human milk. *Pediatric Clinics of North America*, 48(1), pp. 53–67.

Piwoz, E.G. and Huffman, S.L., 2015. The impact of marketing of breast-milk substitutes on who-recommended breastfeeding practices. *Food and Nutrition Bulletin*, 36(4), pp. 373–386.

Pourhoseingholi, A.M., Vahedi, M. and Rahimzadeh, 2013. Sample size calculation in medical studies. *Gastroenterol Hepatol Bed Bench*, 6(1), pp. 14 – 17.

Rahman, A. et al., 2011. Using cognitive-behavioural techniques to improve exclusive breastfeeding in a low-literacy disadvantaged population. *Maternal and Child Nutrition*, 8(1), pp. 57–71.

Riordan, J. and Wambach, K., 2016. *Breastfeeding and human lactation*. 4th ed. Burlington (NJ): Jones & Bartlett Learning.

Rodrigo, R., Rodrigo, A., Liyanage, N., Hatahagoda, W. and Hewavitharana, U., 2018. Maternal Perception of Adequacy of Mother's Milk Among Mothers Giving Birth at a Teaching Hospital in Sri Lanka. *Journal of Human Lactation*, 35, pp. 171–180.

Rosenblatt, K.A. and Thomas, D.B., 1993. Lactation and the risk of epithelial ovarian cancer. The WHO collaborative study of neoplasia and steroid contraceptives. *International Journal of Epidemiology*, 22(2), pp. 192–197.

Saffari, M., Pakpour, A.H. and Chen, H., 2016. Factors influencing exclusive breastfeeding among Iranian mothers: A longitudinal population-based study. *Health Promotion Perspectives*, 7(1), pp. 34–41.

Safon, C. et al., 2017. Determinants of perceived insufficient milk among new mothers in León, Nicaragua. *Maternal and Child Nutrition*, 13(3), e12369.

Santo, L.C., de Oliveira, L.D. and Giugliani, E.R.J., 2007. Factors associated with low incidence of exclusive breastfeeding for the first 6 months. *Birth*, 34(3),

pp. 212–219.

Scott, J.A. and Binns, C.W., 1999. Factors associated with the initiation and duration of breastfeeding: a review of the literature. *Breastfeeding Review: Professional Publication of the Nursing Mothers' Association of Australia*, 7(1), pp. 5–16.

Shelby, R.D., Cromeens, B., Rager, T.M. and Besner, G.E., 2019. Influence of growth factors on the development of necrotizing enterocolitis. *Clinics in Perinatology*, 46, pp. 51–64.

Shohaimi, N.M. et al., 2022. Intention and practice on breastfeeding among pregnant mothers in Malaysia and factors associated with practice of exclusive breastfeeding: A cohort study. *PloS One*, 17(1), p. e0262401.

Smith, M.M., Durkin, M., Hinton, V.J., Bellinger, D. and Kuhn, L., 2003. Influence of breastfeeding on cognitive outcomes at age 6–8 years: follow-up of very low birth weight infants. *American Journal of Epidemiology*, 158(11), pp. 1075–1082.

Solís, G., de Los Reyes-Gavilan, C.G., Fernández, N., Margolles, A. and Gueimonde, M., 2010. Establishment and development of lactic acid bacteria and bifidobacteria microbiota in breast milk and the infant gut. *Anaerobe*, 16(3), pp. 307–310.

Stuebe, A.M. and Rich-Edwards, J.W., 2008. The reset hypothesis: lactation and maternal metabolism. *American Journal of Perinatology*, 26(01), pp. 81–88.

Sullivan, G.M. and Artino, A.R., 2013. Analyzing and interpreting data from Likert-type scales. *Journal of Graduate Medical Education*, 5(4), pp. 541–542.

Tajuddin, A.N.A.N. et al., 2020. Why women chose unassisted home birth in Malaysia: a qualitative study. *BMC Pregnancy and Childbirth*, 20(309), pp. 1–47.

Tang, K., Gerling, K., Chen, W. and Geurts, L., 2019. Information and communication systems to tackle barriers to breastfeeding: Systematic search and review. *Journal of Medical Internet Research*, 21, e13947.

Tang, K.H.D., 2021. From movement control to national recovery plan: Malaysia's strategy to live with COVID-19. *International Journal of Science and Healthcare Research*, 6(4), pp. 286–292.

Taveras, E.M. et al., 2004. Opinions and practices of clinicians associated with continuation of exclusive breastfeeding. *Pediatrics*, 113(4), pp. e283–e290.

Teich, A.S., Barnett, J. and Bonuck, K., 2014. Women's perceptions of breastfeeding barriers in early postpartum period: a qualitative analysis nested in two randomized controlled trials. *Breastfeeding Medicine*, 9(1), pp. 9–15.

Telemo, E. and Hanson, L.A., 1996. Antibodies in milk. *Journal of Mammary Gland Biology and Neoplasia*, 1, pp. 243–249.

The National Health and Morbidity Survey 2016: Maternal and Child Health (MCH), 2016. Kuala Lumpur: Institute for Public Health, Ministry of Health, Malaysia, pp. 23–28.

Thet, M.M. et al., 2016. Barriers to exclusive breastfeeding in the Ayeyarwady region in Myanmar: qualitative findings from mothers, grandmothers, and husbands. *Appetite*, 96, pp. 62–69.

Topothai, C. et al., 2021. Breastfeeding practice and association between characteristics and experiences of mothers living in Bangkok. *International Journal of Environmental Research and Public Health*, 18(15), p. 7889.

United Nations Children's Fund (UNICEF) (2021a). *Breastfeeding* [online]. Available at: <https://data.unicef.org/topic/nutrition/breastfeeding/> [Accessed: 05 January 2022].

United Nations Children's Fund (UNICEF) (2021b). *The extension of the 2025 maternal, infant and young child nutrition targets to 2030* [online]. Available at: <https://data.unicef.org/resources/extension-of-2025-maternal-infant-young-child-nutrition-targets-2030/> [Accessed: 04 March 2022].

Vaahtera, M. et al., 2001. Breastfeeding and complementary feeding practices in rural Malawi. *Acta Paediatrica*, 90(3), pp. 328–332.

van den Bogaard, C., van den Hoogen, H.J., Huygen, F.J. and van Weel, C., 1991. The relationship between breast-feeding and early childhood morbidity in a general population. *Family medicine*, 23(7), pp. 510–515.

Vaughn L.M. et al., 2010. Sociocultural influences on the determinants of breast-feeding by Latina mothers in the Cincinnati area. *Family and Community Health*, 33(4), pp. 318–28.

Vazquez-Vazquez, A., Dib, S., Rougeaux, E., Wells, J. c. and Fewtrell, M.S., 2021. The impact of the COVID-19 lockdown on the experiences and feeding practices of new mothers in the UK: Preliminary data from the COVID-19 New Mum Study. *Appetite*, 156, p. 104985.

Wagg, A.J., Callanan, M.M. and Hassett, A., 2019. Online social support group use by breastfeeding mothers: A content analysis. *Heliyon*, 5(3), p. e01245.

Wang, L., Collins, C., Ratliff, M., Xie, B. and Wang, Y., 2017. Breastfeeding reduces childhood obesity risks. *Childhood Obesity*, 13(3), pp. 197–204.

Watanabe, M.A.E., de Oliveira, G.G., Oda, J.M.M., Ono, M.A. and Guembarovski, R.L., 2012. Cytokines in human breast milk: immunological significance for newborns. *Current Nutrition and Food Science*, 8, pp. 2–7.

Whalen, B. and Cramton, R., 2010. Overcoming barriers to breastfeeding continuation and exclusivity. *Current Opinion in Pediatrics*, 22(5), pp. 655–663.

Wolfberg, A.J. et al., 2004. Dads as breastfeeding advocates: Results from a randomized controlled trial of an educational intervention. *American Journal of Obstetrics and Gynecology*, 191(3), pp. 708–712.

World Health Organization (WHO), 2020. *Breastfeeding and COVID-19* [online]. Available at: <https://www.who.int/news-room/commentaries/detail/breastfeeding-and-covid-19> [Accessed: 03 January 2022].

World Health Organization (WHO), 2021a. *COVID-19 in Malaysia situation report 68* [online]. Available at: <https://www.who.int/malaysia/emergencies/covid-19-in-malaysia/situation-reports> [Accessed: 30 January 2022].

World Health Organization (WHO), 2021b. *Weekly epidemiological update on COVID-19 - 7 December 2021* [online]. Available at: <https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19---7-december-2021> [Accessed: 29 January 2022].

World Health Organization (WHO), 2021c. *WHO Coronavirus (COVID-19) dashboard* [online]. Available at: <https://covid19.who.int/info?openIndex=2> [Accessed: 02 February 2022].

World Health Organization (WHO), n.d.a. *Breastfeeding* [online]. Available at: https://www.who.int/health-topics/breastfeeding#tab=tab_1 [Accessed: 03 January 2022].

World Health Organization (WHO), n.d.b. *Ten steps to successful breastfeeding* [online]. Available at: <https://www.who.int/teams/nutrition-and-food-safety/food-and-nutrition-actions-in-health-systems/ten-steps-to-successful-breastfeeding> [Accessed: 04 March 2022].

Wright, A.L., Holberg, C.J., Martinez, F.D., Morgan, W.J. and Taussig, L.M., 1989. Breast feeding and lower respiratory tract illness in the first year of life. Group Health Medical Associates. *BMJ*, 299(6705), pp. 946–949.

Xu, L. et al., 2017. Systematic review with meta-analysis: breastfeeding and the

risk of Crohn's disease and ulcerative colitis. *Alimentary Pharmacology and Therapeutics*, 46(9), pp. 780–789.

Yeneabat, T., Belachew, T. and Haile, M., 2014. Determinants of cessation of exclusive breastfeeding in Ankesha Guagusa Woreda, Awi Zone, Northwest Ethiopia: a cross-sectional study. *BMC Pregnancy and Childbirth*, 14(262), pp. 1–12.

Yu, J., Gao, M., Wei, Z., Wells, J. and Fewtrell, M., 2022. The impact of the Covid-19 pandemic on maternal delivery experiences and breastfeeding practices in China: data from a cross-sectional study. *BMC Pediatrics*, 22(104), pp. 1–11.

Zhao, Y., Ouyang, Y.Q. and Redding, S.R., 2018. Chinese women's experiences, emotions and expectations of breast-feeding in public: a qualitative study. *Public Health Nutrition*, 21(8), pp. 1565–1572.

APPENDICES

APPENDIX A

Ethical Approval for Research from UTAR



UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/224/2021

4 October 2021

Dr Tan Gim Cheong
Head, Department of Allied Health Sciences
Faculty of Science
Universiti Tunku Abdul Rahman
Jalan Universiti, Bandar Baru Barat
31900 Kampar, Perak.

Dear Dr Tan,

Ethical Approval For Research Project/Protocol

We refer to the application for ethical approval for your students' research project from Bachelor of Science (Hons) Biomedical Science programme enrolled in course UDDD3108. We are pleased to inform you that the application has been approved under Expedited Review.

The details of the research projects are as follows:

No	Research Title	Student's Name	Supervisor's Name	Approval Validity
1.	Breastfeeding Practice, Support and Self-Efficacy and Postpartum Depression (PPD) During Covid-19 Pandemic	Suganya a/p Bala Subramaniam	Ms Kokila Thingarajah	4 October 2021 – 3 October 2022
2.	Maternal Behaviours and Considerations of Breastfeeding Practices in Malaysia During Covid-19 Pandemic	Ching Xin Ni	Dr Michelle Ng Yeen Tun	

The conduct of this research is subject to the following:

- (1) The participants' informed consent be obtained prior to the commencement of the research;
- (2) Confidentiality of participants' personal data must be maintained; and
- (3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.
- (4) Written consent be obtained from the institution(s)/company(ies) in which the physical or/and online survey will be carried out, prior to the commencement of the research.

Kampar Campus : Jalan Universiti, Bandar Baru, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 Fax: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (605) 9086 0288 Fax: (605) 9019 8868
Website: www.utar.edu.my



APPENDIX B

Personal Data Protection Statement (Informed Consent Form)

PERSONAL DATA PROTECTION STATEMENT (INFORMED CONSENT FORM)

Please be informed that in accordance with Personal Data Protection Act 2010 ("PDPA") which came into force on 15 November 2013, Universiti Tunku Abdul Rahman ("UTAR") is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

Notice:

- 1) The purposes for which your personal data may be used are inclusive but not limited to:
 - For assessment of any application to UTAR
 - For processing any benefits and services
 - For communication purposes
 - For advertorial and news
 - For general administration and record purposes
 - For enhancing the value of education
 - For educational and related purposes consequential to UTAR
 - For the purpose of our corporate governance
 - For consideration as a guarantor for UTAR staff/ student applying for his/her scholarship/study loan.
- 2) Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.
- 3) Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.
- 4) UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

- 1) By submitting this form you hereby authorize and consent to us processing (including disclosing) your personal data and any updates of your information, for the purposes and/or for any other purposes related to the purposes.
- 2) If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.
- 3) You may access and update your personal data by writing to the researcher at chingxinni@futar.my

Acknowledgement of Notice *

- I have been notified by you and I hereby understood, consented and agreed per UTAR above notice.
- I disagree, my personal data will not be processed.

APPENDIX C

Questionnaire

Breastfeeding Practices and Challenges During the COVID-19 Pandemic in Malaysia

Dear respondents,

We are final year undergraduate students pursuing Bachelor of Science (Hons) Biomedical Science from Universiti Tunku Abdul Rahman (UTAR), Kampar campus. The purpose of this survey is to investigate the breastfeeding practices and challenges during the COVID-19 pandemic in Malaysia.

Please answer all of the questions to the best of your knowledge. There are no right or wrong responses to any of the questions. All responses from the survey are anonymous and will be kept strictly confidential. Your participation is appreciated.

Instructions:

- 1) This questionnaire consists of Section A - D. Please answer ALL of the questions in ALL the sections.
- 2) Completion of this questionnaire will take you approximately 10 to 20 minutes.

Remark:

Breastfeeding includes feeding a baby with breastmilk either by direct latching or expressed breast milk.

For further assistance or inquiries, please contact the researcher(s) at:
010-7604724 (Ms. Ching)

Please be informed that enquiries via WhatsApp or SMS is preferred.

***Required**

Email *

Cannot pre-fill email address
.....

Inclusion & Exclusion Criteria

Are you a Malaysian mother who has lived in Malaysia over the past 2 years? *

- Yes
- No

Is your youngest baby currently aged between 0 - 24 months? *

- Yes
- No

Do/ did you practice breastfeeding with your youngest's bay? *

- Yes
- No

Are you a Malaysian mother who has lived in foreign countries such as Singapore, Thailand, Taiwan, or United Kingdom over the past 2 years? *

- No
- Yes

Have you or your baby suffered from maternal or neonatal conditions that could interfere with breastfeeding practices? For examples, maternal HIV, active TB infection, herpes simplex lesions on both breasts, mothers undergoing cancer chemotherapy, on antiretroviral therapy, or baby suffering from galactosaemia. *

- No
- Yes

Section A: Demographic Profile

Instructions: Please complete ALL the questions in this part. Fill in the particulars OR choose only one option that best matches your response.

1. Age *

Your answer _____

2. Marital status *

Single

Married

Other: _____

3. Ethnicity *

Malay

Chinese

Indian

Other: _____

4. Current/highest educational level *

Primary education

Lower secondary education (PMR, PT3, or equivalent.)

Upper secondary education (SPM, O level, IGSCCE, or equivalent.)

Tertiary education (Bachelor's degree or below)

Tertiary education (Master's degree or above)

Other: _____

5. Household income (RM) *

- Less than 2000
- 2001 – 4000
- 4001 – 6000
- 6001 – 8000
- 8001 – 10000
- More than 10000

6. Do you belong in the urban or rural region? *

- Urban region
- Rural region

7. Currently living in *

- Central Region (Selangor, Kuala Lumpur or Putrajaya)
- Southern Region (Johor, Negeri Sembilan, Melaka)
- Northern Region (Perak, Penang, Kedah or Perlis)
- East Malaysia (Sabah, Sarawak or Labuan)
- East Coast Region (Kelantan, Pahang or Terengganu)

8. Total number of children *

Your answer _____

9. Youngest baby's age (in months) *

Your answer _____

10. When did you give birth to your youngest baby? *

- Before first MCO (before 18th March 2020)
- During MCOs (from 18th March 2020 to 28th June 2021)
- After MCO/ during National Recovery Plan (after 28th June 2021)

Section B: Infant Feeding Practices and Changes During the COVID-19 Pandemic

Instructions: Please complete ALL the questions in this part. Choose only ONE option that best matches your response.

1. What is your feeding intention for the first 6 months of baby before delivery? *

- Exclusive breastfeeding (fully feed with breast milk)
- Mixed breastfeeding and formula milk
- Formula milk
- No plan
- Other: _____

2. What is/was your feeding practice when your baby is/was aged 0 - 6 months? *

- Exclusive breastfeeding (fully feed with breast milk)
- Mixed breastfeeding and formula milk
- Formula milk
- Other: _____

3. Did you reduce the frequency in breastfeeding due to the COVID-19 pandemic? *

- Yes
- No

4. Did you stop breastfeeding due to the COVID-19 pandemic? *

- Yes
- No

Section C: Perceived Effects on of COVID-19 Lockdown

Please complete ALL the questions in this part. Select the number which BEST shows the strength of your feeling which ranges from 1 – Never; 2 – Sometimes; 3 – Often; 4 – Mostly.

Perceived Effects on of COVID-19 Lockdown *

	1 – Never	2 – Sometimes	3 – Often	4 – Mostly
1. Household crowding during lockdown	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Family stress from confinement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Lack of family support and help with feeding baby	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Received infant feeding support from health personnel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Enough maternal health support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Contact with a 'mother and baby or breastfeeding support group'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section D: Perception on Possible Reasons for Changing Breastfeeding Practices During the COVID-19 Pandemic

Please complete ALL the questions in this part.

Select the number which BEST shows how far do you agree with the reasons that cause mothers to change breastfeeding practices during the COVID-19 pandemic, which ranges from 1 – Strongly disagree; 2 – Disagree; 3 – Neutral; 4 – Agree; 5 – Strongly agree.

Possible reasons for changing breastfeeding practices during the COVID-19 pandemic *

	1 – Strongly disagree	2 – Disagree	3 – Neutral	4 – Agree	5 – Strongly agree
1. Lack of face-to-face support (i.e. insufficient professional support)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Safety fears	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Positive for COVID-19 infection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Exhaustion/stress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Issue with latch/pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Insufficient milk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Embarrassment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Partner not supportive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Family not supportive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Working responsibilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Turnitin Originality Report

Processed on: 21-Apr-2022 11:20 +08
 ID: 1816013033
 Word Count: 12452
 Submitted: 1

Checked by

 21 April 2022

Similarity Index
 9%

Similarity by Source

Internet Sources:	7%
Publications:	5%
Student Papers:	N/A

Maternal Behaviours and Considerations of Bre...
 By Xin Ni Ching

[include quoted](#) [include bibliography](#) [excluding matches < 8 words](#)
[refresh](#) [download](#)

mode: [quickview \(classic\) report](#) [Change mode](#) [print](#)

1% match (publications)

[Balogun, Olukunmi Omobolanle, Amarjagal Dagvadorj, Kola Mathew Anigo, Erika Ota, and Satoshi Sasaki. "Factors influencing breastfeeding exclusivity during the first 6 months of life in developing countries: a quantitative and qualitative systematic review : Factors influencing EBF in developing countries", Maternal and Child Nutrition, 2015.](#)

<1% match (Internet from 31-Dec-2021)

<https://semsub.epa.gov/work/05/970247.pdf>

<1% match ()

[Mekar Dwi Anggraeni. "A Causal model of breastfeeding duration among working muslim mothers in central Java Province, Indonesia", 'Faculty of Medicine Prince of Songkla University', 2015](#)

<1% match ()

[Smith, Graeme. "Dietary and exercise manipulation of skeletal muscle function in older humans"](#)

<1% match (Internet from 04-Feb-2021)

<https://gavinpublishers.com/articles/research-article/Journal-of-Community-Medicine-Public-Health/the-associated-factors-hampering-mothers-towards-exclusive-breastfeeding-EBF-through-knowledge-attitude-and-practice-kap-studies-at-alsabah-children-hospital-juba-south-sudan>

<1% match (publications)

[Leanne Jackson, Leonardo De Pascalis, Joanne A. Harrold, Victoria Fallon, Sergio A. Silverio. "Postpartum women's experiences of social and healthcare professional support during the COVID-19 pandemic: A recurrent cross-sectional thematic analysis", Women and Birth, 2021](#)

<1% match (publications)

[Dipen V. Patel, Satvik C. Bansal, Archana S. Nimbalkar, Ajay G. Phatak, Somashekhar M. Nimbalkar, Rajendra G. Desai. "Breastfeeding Practices, Demographic Variables, and Their Association with Morbidities in Children", Advances in Preventive Medicine, 2015](#)

<1% match (Internet from 31-Jan-2021)

<https://www.taypartners.com.my/en/index.php/covid-19-20200505>

<1% match (publications)

[Emine Gökçeoğlu, Sibel Küçükoğlu. "The relationship between insufficient milk perception and breastfeeding self-efficacy among Turkish mothers", Global Health Promotion, 2016](#)

<1% match (Internet from 25-Jun-2021)

<https://www.thestar.com.my/lifestyle/health/2020/08/18/aiming-to-breastfeed-all-newborns>

<1% match (publications)

[Diana-Leh-Ching Ng, Gin-Gin Gan, Chee-Shee Chai, Nur Adila Bt Anuar, Woweham Sنده, Wei-Jing Chua, Asri B Said, Seng-Beng Tan. "The Willingness of Malaysian Parents To Vaccinate Their Children Below 12 Years Old Against COVID-19 – A Large Cross-Sectional Study", Research Square Platform LLC, 2021](#)

<1% match (publications)

[Harriet Torlesse, Aidan Anthony Cronin, Susy Katikana Sebayang, Robin Nandy. "Determinants of stunting in Indonesian children: evidence from a cross-sectional survey indicate a prominent role for the water, sanitation and hygiene sector in stunting reduction" BMC Public Health, 2016](#)

<1% match (Internet from 28-May-2019)

<https://www.onlinejournal.in/IJIRV2I11/277.pdf>

<1% match (publications)

["Nutrition and Health in a Developing World", Springer Science and Business Media LLC, 2017](#)

<1% match (Internet from 18-Dec-2016)

<http://journals.sbmu.ac.ir>

<1% match (publications)

[Guilherme Borges, Sol Durand Arias, Jaime Carmona-Huerta, Alejandro Aldana-López et al. "Risk Factors and Resilience Associated to Depressive Symptoms in Mexican Healthcare Workers During the Early Stages of the Covid-19 Pandemic", Research Square Platform LLC, 2022](#)

<1% match (Internet from 13-Oct-2021)

<https://ijedr.org/papers/IJEDR1902036.pdf>

<1% match (Internet from 23-Dec-2021)

<https://www.abacademies.org/articles/strategic-planning-practices-for-covid19-pandemic-a-study-on-malaysian-quantity-surveying-firms.pdf>

Universiti Tunku Abdul Rahman

Form Title: Supervisor's Comments on Originality Report Generated by Turnitin for Submission of Final Year Project Report (for Undergraduate Programmes)

Form Number: FM-IAD-005

Rev No.: 1

Effective Date: 3/10/2019

Page No.: 1 of 1



FACULTY OF SCIENCE

Wholly owned by UTAR Education Foundation
(Co. No. 578227-M)

Full Name(s) of Candidate(s)	CHING XIN NI
ID Number(s)	19ADB06955
Programme / Course	BACHELOR OF SCIENCE (HONS) BIOMEDICAL SCIENCE
Title of Final Year Project	MATERNAL BEHAVIOURS AND CONSIDERATIONS OF BREASTFEEDING PRACTICES IN MALAYSIA DURING THE COVID-19 PANDEMIC

Similarity	Supervisor's Comments (Compulsory if parameters of originality exceeds the limits approved by UTAR)
Overall similarity index: 9% Similarity by source Internet Sources: 7% Publications: 5% Student Papers: N/A	NIL
Number of individual sources listed of more than 3% similarity: 0	NIL
Parameters of originality required and limits approved by UTAR are as follows: (i) Overall similarity index is 20% and below, and (ii) Matching of individual sources listed must be less than 3% each, and (iii) Matching texts in continuous block must not exceed 8 words <i>Note: Parameters (i) – (ii) shall exclude quotes, bibliography and text matches which are less than 8 words.</i>	

Note Supervisor/Candidate(s) is/are required to provide softcopy of full set of the originality report to Faculty/Institute

Based on the above results, I hereby declare that I am satisfied with the originality of the Final Year Project Report submitted by my student(s) as named above.

Signature of Supervisor

Name: Dr. Michelle Ng Yeen Tan

Date: 21st APRIL 2022