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## Abstract

1  
2       **Background:** The six-month exclusive breastfeeding (EBF) rate almost halved between  
3 2009 and 2013 in Northeast Thailand for no clear reason. Specific facilitators and barriers to six-  
4 month EBF have been identified for Thailand, but mothers' views on these factors to continuing  
5 EBF breastfeeding until six months have not been explored in this region. **Aim:** This study aimed  
6 to prioritise mothers' views on the identified facilitators and barriers of continuing six-month  
7 exclusive breastfeeding. **Methods:** Q-methodology was applied. This research was conducted at  
8 Well Baby Out-Patient Department of Khonkaen Hospital, Numphong Hospital and a private  
9 hospital. Thirty-four mothers, who had recently delivered infants aged between four and six months,  
10 were breastfeeding/had breastfed, were 20 to 40 years old, participated. Demographic data were  
11 analysed descriptively and Q-method analysis was conducted using the PQ Method software 2.35.  
12 **Results:** There was consensus that having knowledge about the advantages of EBF was the most  
13 important facilitator of six-month EBF, and "not having any other responsibilities besides caring  
14 for her infant" was the least important facilitator of six-month EBF. Three viewpoints emerged  
15 identifying different groups/clusters of mothers, namely (1) Caring for self, (2) Requiring support  
16 and (3) Breastfeeding knowledge. **Conclusions:** Despite some consensus among participants, three  
17 distinct viewpoints emerged regarding which facilitators and barriers were important to mothers. It  
18 is clear that a programme to improve the six-month EBF rate in Northeast Thailand would need to  
19 incorporate interventions or activities that address the different viewpoints identified.

1 **Keywords:** Q-methodology, six-month exclusive breastfeeding, facilitator, barrier, Northeast

2 Thailand

## Introduction

1  
2 Exclusive breastfeeding (EBF) amid infant feeding is comprised solely of breast milk  
3 (including breastmilk from expressing, pumping, or a wet nurse). This does not include water, other  
4 food or fruits. Nevertheless, medicines, vitamin syrups, or oral dehydration solutions are provided  
5 in cases of medical necessity (World Health Organization (WHO), 2021). Many obvious short and  
6 long-term benefits of breastfeeding for both mother and child have been previously presented. For  
7 mothers, breastfeeding can reduce the risk of postpartum haemorrhage, promote uterine involution,  
8 decrease postpartum depression, reduce the mother's risk of certain illnesses such as diabetes  
9 mellitus type 2, hypertension, hyperlipidemia, cardiovascular disease, ovarian cancer, weight loss,  
10 and restore body shape post-delivery (Couto, Dias, & Oliveira, 2020). For infants, breastfeeding  
11 can stimulate optimal physiological and psychological growth and development, increase the  
12 infant's intelligence scores, develop the bond between the infant and mother, and reduce the  
13 incidence of various of infections such as gastrointestinal tract infections, necrotising enterocolitis,  
14 pneumonia, respiratory tract infection, bronchiolitis, and allergic diseases such as asthma, atopic  
15 dermatitis, and eczema (Thophothai et al., 2013, Semrau et al., 2011; Tamiru et al., 2012).

16 In 2009, women of reproductive age (15 to 49 years) accounted for 18,819,775 individuals  
17 in Thailand. In Northeast Thailand, that number is 6,187,747. Reports have shown that initiation  
18 of EBF within 24 hours accounted for just 15.1% of newborns (National Statistical Office Thailand  
19 (NSO Thailand), 2010). In addition, National and regional statistics reported that the rates of EBF  
20 within the first hour of birth dropped from 46% in 2013 to 39% in 2016 (NSO Thailand, 2013; NSO  
21 Thailand, 2016). In 2010, a steady drop in EBF rates was reported as time passed, with one-month,

1 two-month and four-month EBF rates reported as 78%, 63%, and 35% respectively (Kupratakul et al,  
2 2010).

3         Following the lead of the World Health Organisation and other global institutions and  
4 countries, Thailand has recognised the importance of EBF for six months. A national target was  
5 therefore set in 2012 to increase the six-month EBF rate to 30% (National Economic and Social  
6 Development Board Thailand, 2012). Despite many initiatives and interventions to support,  
7 promote and protect EBF in trying to achieve this target, the EBF rate in Thailand dropped from  
8 14.5 % in 2005 to 12.3% in 2013, far below the national target (NSO Thailand, 2010; NSO Thailand,  
9 2013). More disturbing though was that in the Northeast region, the rate dropped significantly from  
10 26.9% in 2009 to 13.8% in 2013, which impacted negatively on the national level (NSO Thailand,  
11 2010; NSO Thailand, 2013).

12         As per the statistics of EBF in Thailand, the rate of initiated EBF is quite high. However,  
13 the trend of continuing EBF is dropping. This highlights that the continuation of EBF is  
14 challenging. At regional level, the six-month EBF rate in Northeast Thailand is the lowest (18%)  
15 (NSO Thailand, 2016). This has led to the decreasing of the national six-month EBF rate from 2013  
16 to 2016. Hence, increasing the six-month EBF rate in this region is a concern that may spark action  
17 resulting in a greater EBF rate in Thailand.

18         To improve the six-month EBF rate in Thailand, it seems that a relevant intervention  
19 strategy should be targeted at the Northeast region. As the process of developing complex  
20 interventions starts with exploring the evidence and obtaining mother opinion (Craig et al., 2013),

1 this study aims to build on the previous literature review (Thepha et al., 2017) and focus group  
2 discussions (Thepha et al., 2018) which identified specific facilitators and barriers in Northeast  
3 Thailand. This article explores the opinions of women in Northeast Thailand regarding the  
4 prioritisation of facilitators and barriers to continuing six-month EBF in this region which can  
5 further affect the development of a relevant intervention strategy.

6

7

## Methodology

### 8 Design

9 Q-methodology, which is a quantitative method that allows for the prioritisation of  
10 identified factors, was applied (Watta & Stenner, 2012). Q-methodology has been applied in  
11 Thailand, for example, to explore health beliefs (Guptarak et al., 2019). Yet, it is the first time that  
12 this method had been applied to explore the viewpoints concerning the facilitators and barriers to  
13 six-month EBF in Thailand. Q-statements of facilitators and barriers related to six-month EBF in  
14 Northeast Thailand, were developed by reviewing the themes from the focus group discussions  
15 held with Northeast Thai mothers (n=30) (Thepha et al., 2018). The Q-statements were finalised by  
16 the research team, and piloted with mothers with experience of 4 months breastfeeding (n=2) to  
17 clarify the meaning of each statement and ensure content validity. The final statements, which  
18 comprised 50 statements, were each written on a card (Figure 1) to be provided to participants for  
19 sorting. Participants were given 30-45 minutes to prioritise the statements. Each prioritisation  
20 session was conducted by the same researcher (TT) in Thai. Participants were asked, “What are the

1 most important factors influencing six-month EBF in Northeast Thailand?” They were asked to  
2 carefully read each of the final statement cards (in Thai) and roughly sort them into three groups i.e.  
3 those statements they disagreed with, those they agreed with and those they felt neutral about.  
4 Participants were then encouraged to sort each statement card onto the Q-methodology score sheet  
5 (Figure 2), which forces prioritisation through the pyramid shaped stacking of the 50 blocks and  
6 indicated qualifiers ranging from ‘strongly disagree’ (-5), to ‘strongly agree’ (+5). The final  
7 prioritisation results were electronically recorded as a photograph.

8

## 9 **Setting**

10 According to Thailand’s national report, nationally over 90% of mothers delivered their  
11 children at a government hospital (Urban and Peri-urban hospital) (NSO Thailand, 2010). Two out  
12 of five of these mothers gave birth at Peri-urban hospitals (NSO Thailand, 2010). So, approximately  
13 10.8% of mothers gave birth at private hospitals (NSO Thailand, 2010). Following the national  
14 statistics, data was collected at Khonkaen Hospital (urban hospital), Numphong Hospital (peri-  
15 urban hospital) and at a private hospital in Khonkaen, Thailand.

16

## 17 **Sample**

18 Watts and Stenner (2012) suggest that the sample size for Q-methodology is dependent on  
19 the number of Q-statements. The minimum ratio between participants in the sample and the number  
20 of statements is 1:2. Thus, a sample of at least 25 mothers was required for this study. Self-selection  
21 sampling is a type of non-probability sampling technique (Allsop & Saks, 2013). Participants are

1 selected via inclusion and exclusion criteria which suits the research question (Allsop & Saks,  
2 2013). In order to obtain the opinions of women in Northeast Thailand regarding the prioritisation  
3 of facilitators and barriers to six-month EBF, mothers were recruited via self-selection sampling.  
4 The inclusion criteria of participants were Northeastern-Thai mothers aged 20 to 40 years who had  
5 recently delivered infants currently aged between four and six months, were breastfeeding or had  
6 experience of breastfeeding and used the maternity services of Khonkaen Hospital, Numphong  
7 Hospital or a private hospital. Recruitment posters (in Thai) were placed at each of the selected  
8 hospitals on notice boards. Willing prospective participants, who contacted the researcher, were  
9 asked to select a suitable date for an interview at one of three central locations - private rooms at  
10 Khonkaen and Numphong hospitals or a meeting room at the Faculty of Nursing, Khonkaen  
11 University. Information sheets (in Thai) were sent, to participants via post and email in accordance  
12 with their expressed preference. Before the interview, participants were briefed about the aim of  
13 the research and given the opportunity to sign consent forms. Once consent was obtained, a brief  
14 socio-demographic questionnaire was completed and instructions provided on the process of  
15 prioritisation of the Q-statements. Data collection was conducted between 1 October 2015 and 30  
16 November 2015. Ethical approval was granted by the University of Aberdeen (IRB No.  
17 CERB/2015/3/1147) as well as Khonkaen Hospital, Thailand (IRB No. KE 58059). Any information  
18 collected for the study was kept confidential. The use of anonymous quotations has been applied.  
19 The data will be stored in a safe place in University of Aberdeen for five years from the date of  
20 publication. Moreover, it can be only accessed by the research team.



## 1 **Measurement**

2           Characteristic data of participants were analysed using descriptive statistics. The  
3           prioritisation sorting of each participant was entered into the PQ Method software 2.35 for the  
4           generation of consensus statements and viewpoint clustering. Consensus statements are the  
5           statements that do not differ among participants' prioritising of the Q-statements. Centroid factor  
6           analysis is applied by the software, which distinguishes whether there are any correlations between  
7           participant's prioritising of the Q-statements (Watts & Stenner, 2008) by clustering them in various  
8           viewpoints. These viewpoints are then subjected to varimax rotation which maximises the amount  
9           of variance explained by factors. Then, to identify the most relevant number of viewpoints, the  
10          viewpoints are tested against three basic assumptions; 1) its eigenvalue must be greater than 1.0  
11          (the eigenvalues are indicative of a factor's statistical strength and explanatory power) (Watts &  
12          Stenner, 2012), 2) the point at which the line slopes change in the Scree test as per Figure 3 (Cattell,  
13          1966), and 3) an independent expert in Q-methodology applies their judgment to suggest a cut-off  
14          point. Finally, each viewpoint was given a name by the research team. Distinguishing statements  
15          (those significantly different at  $p < 0.05$ ) were used to determine key statements which differ  
16          between viewpoints. In addition, the mode score, which is the number that the statement is selected  
17          by the participants in that viewpoint, was used to identify the most popular statements within each  
18          viewpoint.

19

20

## **Results**

1           Thirty-four women participated in the study with a mean age of 29 years (SD=5.3, range 25-  
2 37 years). The durations of EBF were 4 months (N=15), 5 months (N=2), and 6 months (N=17) (Mean  
3 = 5.1 months, SD=0.98). Participants had a variety of occupations (secretary (n=2), labourer (n=3),  
4 lecturer (n=2), salesperson (n=6), nurse (n=2), office worker (n=5), housewife (n=6), factory worker  
5 (n=4), librarian (n=1), pharmacist (n=1), and business owner (n=2). To provide some context to the  
6 viewpoints, the occupations were grouped as professional workers, i.e. professions requiring a  
7 professional licence (n=11), and non-professional workers, i.e. not requiring a professional licence  
8 (n=23). Participants were recruited from Khonkaen Hospital (n=18), Numphong Hospital (n=9) and a  
9 private hospital (n=7) grouped as urban (Khonkaen and private hospital; n=25) and peri-urban  
10 (Numphong Hospital; n=9).

11  
12           There were consensus statements which Thai Northeast all the mothers agreed were  
13 important factors in continuing EBF for six months. The statements that mothers felt were  
14 important and facilitative to six-month EBF in Northeast Thailand were statement 3, 4, 8, 17, 33,  
15 46 (Table 1). All the mothers agreed that certain knowledge was essential to encouraging six-  
16 months EBF especially that breastmilk contains all the essential nutrients for the infant and  
17 knowing how to assess whether the infant is latched correctly. Getting advice from those that have  
18 breastfed was fairly important to all and understanding that BF is not difficult or that babies cry  
19 for other reasons as well, were also quite important for all. All mothers felt quite neutral about  
20 promoting EBF in public and in society. Mothers identified the statements 5, 15, 23, 29, 30, 32, 42  
21 as least important factors regarding six-month EBF in this region. Interestingly, all mothers felt

1 quite strongly that not having other responsibilities did not impact on continuing EBF. Rooming-  
2 in at hospital and eating certain foods were also not felt to be important by all. Preparing older  
3 children to not be jealous of the infant BF was also dismissed as fairly unimportant to all mothers  
4 as was knowing that BF does not makes babies fat. Knowing that infants have a small stomach  
5 capacity and getting support within the first 24 hours were also not felt to be that important by all.

6  
7 Following the Q-factor analysis, three viewpoints (eigenvalues greater than 1.0, the line  
8 slopes had significantly changed in the Scree test, and independent expert approved) emerged.  
9 These three viewpoints were named as (1) Caring for self, (2) Requiring support and (3)  
10 Breastfeeding knowledge. The three viewpoints were shared by 14 for viewpoint 1, seven for  
11 viewpoint 2 and 8 for viewpoint 3, whereas five mothers did not share these three viewpoints and  
12 were excluded from further analysis relating to the viewpoints.

13

#### 14 **Viewpoint 1: Caring for self**

15 Mothers with this viewpoint identified seven statements (16, 18, 21, 22, 24, 25, 27) (Table 2)  
16 that were significantly ( $p < 0.05$ ) more important in facilitating six-month EBF for them and these  
17 related mainly to caring for yourself in terms of maternal nutrition. In contrast, they identified nine  
18 statements (9, 11, 12, 13, 31, 40, 48, 49, 50) that they felt significantly ( $p < 0.05$ ) were less important  
19 in facilitating six-month EBF for them and these related to accessing BF information or support  
20 and knowing about supplementary feeding practices. There were 14 mothers (41% of the sample)  
21 who identified with this viewpoint, with an average age of 28.7 years ( $SD=5.75$ , range 20-37). The

1 average duration of EBF in this group was five months (SD=1.03) and participants were mainly  
2 from urban areas (n=9) and non-professional workers (n=10) (Table 3).

3

#### 4 **Viewpoint 2: Requiring support**

5 Mothers with viewpoint 2 identified six statements (28, 36, 38, 41, 45, 47) (Table 4) that were  
6 significantly ( $p<0.05$ ) more important in facilitating six-month EBF for them and these related  
7 mainly to requiring support from their husbands, having the right tools (breast pump) and a  
8 supportive working environment. On the other hand, they identified six statements (18, 19, 20, 21,  
9 26, 35) (Table 4) that they felt significantly ( $p<0.05$ ) were less important in facilitating six-month  
10 EBF for them and these related to traditional beliefs especially relating to water consumption while  
11 breastfeeding. There were seven mothers (21% of the sample) who identified with this viewpoint,  
12 with an average age of 31 years (SD=3.68, range: 27-37). Their average EBF duration of EBF in this  
13 group was 5.6 months (SD=0.78), and participants were all from urban areas and non-professional  
14 workers.

15

#### 16 **Viewpoint 3: Breastfeeding knowledge**

17 Mothers with this viewpoint identified six statements (7, 10, 14, 49, 12, 44) (Table 5) that  
18 were significantly ( $p<0.05$ ) more important in facilitating six-month EBF for them and these related  
19 to having EBF knowledge or being able to access information. In contrast, they identified eight  
20 statements (25, 27, 28, 37, 39, 41, 43, 45) that they felt significantly ( $p<0.05$ ) were less important in

1 facilitating six-month EBF for them and these related to having a girl baby, not working/working  
2 in a supportive environment, family support, maternity leave and home visits from healthcare  
3 volunteers (Table 5). There were eight participants (24% of the sample) who identified with this  
4 viewpoint, with an average age of 29 years (SD=5.30, range: 20-34). The average EBF duration was  
5 5.37 months (SD=0.91, range: 4-6 months) and participants were of urban origin and mainly  
6 professionals (n=6).

7

## 8 **Discussion**

9 There are two important findings from the prioritising activity. Firstly, there are some factors  
10 whereby all mothers agreed on the important and non-important facilitators to EBF for six months.  
11 Secondly, there are different viewpoints regarding the importance of the facilitating factors amid  
12 specific groupings of mothers.

13

14 By consensus, mothers in this study agreed that breastfeeding knowledge, whereby breast  
15 milk provides all the essential nutrients, correct latching, and learning from experience, were  
16 essential to encouraging six-months of EBF. Similar findings were revealed in studies carried out  
17 in Central and Southern Thailand whereby knowledge in relation to EBF was reported as a major  
18 facilitator to EBF (Barnes & Perngarn, 2013; Nualjam et al., 2013; Wangsawat et al., 2014).  
19 Globally, these results are also corroborated by studies in Bangladesh (Thakur et al., 2012),  
20 Pakistan (Ali et al., 2011), Iran (Kermani et al., 2012), the United Arab Emirates (Radwan, 2013),  
21 Vietnam (Kim & Chapman, 2013), and Zimbabwe (Nduna et al., 2015). This suggests that an

1 intervention to improve mothers' breastfeeding knowledge, for example in the form of community-  
2 based education (Bich et al., 2019), mothers' education in the antenatal period (Woldeamanuel,  
3 2020), and drawing on the experiences of others must be prioritised in Northeast Thailand.

4           Interestingly, all mothers also agreed that having other responsibilities, hospital policies,  
5 and traditional beliefs regarding certain foods were not so important in terms of facilitating six-  
6 month EBF. However, local foods being provided to post-partum mothers and/or infants according  
7 to traditional beliefs has been noted as a barrier to EBF in Thailand (Thepha et. al., 2018). In other  
8 countries such as in the Middle East, Southern Africa, China, Brazil, and Zimbabwe, the local food  
9 (different countries have different kinds of local foods) has been reported as a barrier to exclusive  
10 breastfeeding (Alemayehu, 2009; Fjeld et al., 2008; Nankunda et al., 2006; Radwan, 2013; Nduna  
11 et al., 2015). Being employed was discovered as a major obstacle in Malaysia, Pakistan, and India  
12 (Bansal, 2013; Chen et al., 2006; Tan, 2011). Hospital lactation policies were identified as being a  
13 significant barrier in the USA (Weddig et al., 2011). Curiously, all mothers in Thailand felt quite  
14 neutral about promoting EBF in public. Similarly, this was also found in a study in Canada  
15 (Sheeshka et al., 2001). Nonetheless, in Taiwan, most public areas or workplaces are not equipped  
16 to support breastfeeding (Chen et al., 2006). According to these points, in Thailand, being  
17 employed, hospital policies, traditional food beliefs, and promoting EBF in public can be of  
18 secondary focus in the implementation of a six-month EBF intervention.

19           There are three different viewpoints according to the characteristics of mothers. This clearly  
20 shows that to increase the six-month EBF in Northeast Thailand, there is no one specific

1 intervention to address the varied priorities. The three very different viewpoints indicate that a  
2 complex intervention is required to address all of the consensus and prioritised facilitators or  
3 barriers.

4 To date, in Thailand, there have been many interventions aiming to increase the EBF rate.  
5 Both government and non-government organisations have conducted interventions such as the  
6 Baby Friendly Hospital Initiative (BFHI) (Ministry of Social Development and Human Security,  
7 2014), breastfeeding community projects, introducing breastfeeding areas in the workplace (Thai  
8 Breastfeeding Center Foundation, 2014), subscribing to the International Code of Marketing of  
9 Breast-milk Substitutes, (UNICEF, 2012), maternity leave (Dornan et al., 2015), increasing self-  
10 efficacy program availability for mothers (Prasopkittikun & Sangperm, 2017). However, gaps in  
11 previous interventions have been found, such as interventions focused solely on one aspect,  
12 interventions did not cover the entirety of factors which influence the EBF situation, and most  
13 interventions were solely developed from a healthcare professional aspect. In addition, in Northeast  
14 Thailand, policies being implemented with a top-down approach and being unspecific to regions  
15 are other reasons leading to the unsuccessful continuation of six-month EBF (NSO Thailand, 2013).

16 In order to fill these gaps, the findings in this study which are, increasing mothers'  
17 breastfeeding knowledge (regarding the advantages of breastmilk and BF, correct latching and  
18 expressing techniques, correct nutrition for BF), sharing positive breastfeeding experiences,  
19 knowing where/how to access information to support their EBF experience, ensuring support is  
20 available from husbands, and the working environment, should be included in new interventions.  
21 Furthermore, it is necessary to design complex interventions which cover all facilitators and

1 barriers influencing six-month EBF in Northeast Thailand. Likewise, covering the weak points of  
2 previous interventions, development from local information, existing situations, cultural contexts,  
3 and creating sustainable interventions including policies ought to be considered.

4

### 5 **Strengths and limitations**

6 The varied sample of 34 mothers is a strength as the size is deemed sufficient for the design  
7 of Q-methodology (Watts and Stenner, 2008). Mothers were recruited from both urban and rural  
8 areas, and exhibited various occupations. A limitation of the study was that as a result of time  
9 constraints, the cognitive interviewing aspect of Q-methodology (thinking out loud regarding  
10 thought process while prioritising) was not recorded or analysed. This may have provided for a  
11 deeper understanding of why certain decisions were made and the motivations across viewpoints.  
12 Another study limitation was only mothers who had recently delivered infants currently aged  
13 between four and six months provided the data. Notably, these mothers are possibly in favour of  
14 breastfeeding. Therefore, there is a lack of viewpoints from mothers who had no breastfeeding  
15 experience or mothers not in favour of breastfeeding.

16

### 17 **Conclusion**

18 Mothers' views on the identified facilitators and barriers of continuing six-month EBF were  
19 explored. Having knowledge about the advantages of EBF was the most important facilitator of  
20 six-month EBF, and "not having any other responsibilities besides caring for one's infant" was the  
21 least important facilitator of six-month EBF. Three viewpoints emerged identifying different



1 groups/clusters of mothers, namely (1) Caring for self, (2) Requiring support and (3) Breastfeeding  
2 knowledge. It is clear that an intervention to improve the six-month EBF rate in Northeast Thailand  
3 would need to incorporate interventions or activities that address those facilitators and barriers that  
4 were found to be important for all and for each viewpoint, suggesting that a complex and varied  
5 intervention strategy may be needed.

### 6 **Acknowledgement**

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8 University of Aberdeen. This research did not receive any specific grant from funding agencies in  
9 the public, commercial, or not-for-profit sectors.

### 10 **Highlights**

- 11 • Variety of facilitators and barriers to six-month EBF have been found. Specific facilitators  
12 and barriers to six-month EBF have been identified for Northeast Thailand.
- 13 • “Having knowledge about the advantages of EBF” was the most important statement to  
14 facilitate to six-month EBF among mothers in Northeast Thailand.
- 15 • “Not having any other responsibilities besides caring for her infant” was the least important  
16 statement for facilitation of six-month EBF among mothers in Northeast Thailand.
- 17 • “Caring for self”, “ Requiring support” and “Breastfeeding knowledge” were identified as  
18 a diversity of homogenous groups/clusters of mothers to improve the six-month EBF in  
19 Northeast Thailand

20

## References

- 1  
2 Alemayehu, T., Haider, J., & Habte, D., 2009. Determinants of exclusive breastfeeding practices  
3 in Ethiopia. *Ethiopian Journal of Health Development*, v23(1), 12-18.
- 4 Ali, S., Ali, F. S., Imam, M. A., Ayub, S., & Billoo, G. A., 2011. Perception and practices of  
5 breastfeeding of infants 0-6 months in an urban and a semi-urban community in Pakistan: A  
6 cross-sectional study. *Journal of Pakistan Medical Association*, v61(1).
- 7 Allsop, J., Saks, M., 2013. *Researching health: qualitative, quantitative and mixed methods*.  
8 London; SAGE.
- 9 Bansal, C. P., 2013. Breastfeeding- why are we still failing?. *Indian Academy of Pediatrics*,  
10 v50(11), 993-994.
- 11 Barnes, B. S., & Perngparn, U., 2013. Exclusive breastfeeding experiences among mothers in  
12 Bangkok, Thailand: Findings from a mixed-methods study. *Journal of Health Research*,  
13 v27(1), 19-25.
- 14 Bich, H.T., Long, K.T., and Hoa, P.D., 2019. Community-based father education intervention on  
15 breastfeeding practice: Results of a quasi-experimental study. *Maternal and Child nutrition*,  
16 v15(S1). doi: org/10.1111/mcn.12705
- 17 Cattell, R. B., 1966. The scree test for the number of factors. *Multivariate Behavioural Research*,  
18 v1(2), 245-276.

- 1 Chen, C., Y, Wu, C. Y., & Chie, C. W., 2006. Effects of work-related factors on the breastfeeding  
2 behavior of working mothers in a Taiwanese semiconductor manufacturer: A cross-sectional  
3 survey. *BMC Public Health*, v6(160). doi: 10.1186/1471-2458-6-160
- 4 Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M., 2013. Developing  
5 and evaluating complex interventions: The new medical research council guidance.  
6 *International Journal of Nursing Studies*, v50 (5), 585-592. doi: 10.1016/j.ijnurstu.2012.09.010.
- 7 Couto, R.G., Dias, V., Oliveira, L. I., 2020. Benefits of exclusive breastfeeding: An integrative  
8 review. *Nursing Practice Today*, v7(4). doi:https://doi.org/10.18502/npt.v7i4.4034
- 9 Dornan, L., Sinclair, M., Kernohan, W. G.; Stockdale, J., Khuwuthyakorn, V., Suppasan, P., 2015.  
10 Thai cultural influences on breastfeeding behaviour. *Evidence Based Midwifery*, 13(3), 84-91.
- 11 Guptarak, M., Conway, J., Stone, E.T., 2019. Health Beliefs of Nurses in Northern Thailand: A Q-  
12 Methodology Study. *Journal of Transcultural Nursing*.  
13 doi:org/10.1177/1043659619865589
- 14 Kermani, M. R., Nedaeifard, L., Tehrani, A. M., Nateghi, R. M., & Fazeli, S. A., 2012. Pattern of  
15 breastfeeding in infants conceived by assisted reproductive techniques at royal institute from  
16 birth to 6 months in Tehran-Iran. *Journal of Family and Reproductive Health*, v3(6), 105-109.
- 17 Kim, D. T., & Chapman, S. R., 2013. Knowledge, attitude and practice about exclusive  
18 breastfeeding among women in Chililab in Chi Linh town, Hai Duong province, Vietnam.  
19 *Journal of Health Research*, v27(1), 39-44.

- 1 Kupratakul, J., Taneepanichskul, S., Voramongkol, N., & Phupong, V., 2010. A randomized  
2 controlled trial of knowledge sharing practice with empowerment strategies in pregnant  
3 women to improve exclusive breastfeeding during the first six months postpartum. *Journal*  
4 *of the Medical Association of Thailand*, v93(9), 1009-1018.
- 5 Fjeld, E., Siziya, S., Katepa-Bwalya, M., Kankasa, C., Moland, K. M., Tylleskär, T., & the  
6 PROMISE-EBF Study Group., 2008. 'No sister, the breast alone is not enough for my baby' a  
7 qualitative assessment of potentials and barriers in the promotion of exclusive breastfeeding  
8 in southern Zambia. *International Breastfeeding Journal*, v3(26), 1-12. doi:10.1186/1746-4358-  
9 3-26.
- 10 Ministry of Social Development and Human Security., 2014. The family relationship project.  
11 Retrieved from <http://www.familylove.go.th/site/index.php>
- 12 Nankunda, J., Tumwine, J., Soltvedt, A., Semiyaga, N., Ndeezi, G., & Tylleskr, T., 2006.  
13 Community based peer counsellors for support of exclusive breastfeeding: Experiences from  
14 rural Uganda. *International Breastfeeding Journal*, v1, 19. doi: 10.1186/1746-4358-1-19.
- 15 National Economic and Social Development Board., 2012. 11th national economic and social  
16 development plan of Thailand A.D.2012-2016. Bangkok: Office of the prime minister.
- 17 National Statistical Office Thailand (NSO Thailand), 2010. The 2009 reproductive health survey.  
18 Bangkok: Statistical forecasting bureau.
- 19 National Statistical Office Thailand (NSO Thailand), 2013. Multiple indicator cluster survey:  
20 MICS4. Bangkok: Statistical forecasting bureau.

- 1 National Statistical Office Thailand. (2016). Thailand multiple indicator cluster survey 2015-2016:  
2 Bangkok: Statistical forecasting bureau.
- 3 Nduna, T., Marais, D., & Wyk, V. B., 2015. An explorative qualitative study of experiences and  
4 challenges to exclusive breastfeeding among mothers in rural Zimbabwe. *Infant Child and*  
5 *Adolescent Nutrition*, v7(2), 69-76. doi: 10.1177/1941406414568562.
- 6 Nualjam, P., Phumthritikun, P., Muttawangkul, C., Kumrot, W., Chunchachreun, K.,  
7 Hongkraileart, N., ... Kounghmun, S., 2013. Factors affected to behaviour and during time for  
8 breastfeeding of Pasi Charoen persons. Siam university: Research centre for development.
- 9 Prasopkittikun, T., & Sangperm, P., 2017. Self-efficacy promoting interventions for breastfeeding  
10 outcomes: An integrative review of research conducted in Thailand. *Pacific Rim*  
11 *International Journal of Nursing Research*, 21(1), 44-58.
- 12 Radwan, H., 2013. Patterns and determinants of breastfeeding and complementary feeding  
13 practices of emirate mothers in the United Arab Emirates. *BMC Public Health*, v13(171), 1-  
14 11. doi: 10.1186/1471-2458-13-171
- 15 Semrau, K., Kuhn, L., Brooks, R. D., Cabral, H., Sinkala, M., Kankasa, C., ... Aldrovandi, M. G.,  
16 2011. Exclusive breastfeeding, maternal HIV disease, and the risk of clinical breast  
17 pathology in HIV-infected, breastfeeding women. *American Journal of Obstetrics &*  
18 *Gynecology*. v205(344), e1-8.
- 19 Sheeshka, J., Potter, B., Norris, E., 2001. Women's Experiences Breastfeeding in Public Places.  
20 *Journal of Human Lactation*. v17(1), 31-38. doi: 10.1177/089033440101700107

- 1 Tamiru, D., Belachew, T., Loha, E., & Mohammed, S., 2012. Sub-optimal breastfeeding of infants  
2 during the first six months and associated factors in rural communities of jimma arjo  
3 woreda, southwest ethiopia. *BioMed Central Public Health*. v12(363).
- 4 Tan, L. K., 2011. Factors associated with exclusive breastfeeding among infants under six months  
5 of age in peninsular Malaysia. *International Breastfeeding Journal*, v6(2). doi: 10.1186/1746-  
6 4358-6-2.
- 7 Thai breastfeeding center foundation., 2014. Thai breastfeeding center foundation. Retrieved from  
8 <http://www.thaibreastfeeding.org/page.php?id=21>
- 9 Thakur, S., Roy, S., Pual, K., Khannam, M., Khatun, W., & Sarker, D., 2012. Effect of nutrition  
10 education on exclusive breastfeeding for nutritional outcome of low birth weight babies.  
11 *European Journal of Clinical Nutrition*, v66(2), 376-381. doi: 10.1038/ejcn.2011.182
- 12 Thepha, T., Marais, D., Bell, J., & Muangpin, S., 2017. Facilitators and barriers to exclusive  
13 breastfeeding in Thailand: A narrative review. *Journal of Community and Publish Health*  
14 *Nursing*, v3(1). doi:10.4172/2471-9846.1000160
- 15 Thepha, T., Marais, D., Bell, J., & Muangpin, S., 2018. Perceptions of Northeast Thai  
16 breastfeeding mothers regarding facilitators and barriers to six-month exclusive  
17 breastfeeding: Focus group discussions. *International Breastfeeding Journal*, v13(14),1-10.  
18 doi: 10.1186/s13006-018-0148-y
- 19 Thophothai, T., Thaijinda, C., Seartgaikul, N., Phuthasri, V., Bunthumchareung, K., Prakongsai,  
20 P., & Pongutthata, S., 2013. The study of perception of exclusive breastfeeding promotion

- 1 and powdered advertisement with knowledge, attitude and decision of mother and relative.
- 2 Thailand: International health policy program, Ministry of Public Health.
- 3 UNICEF., 2012. International code of marketing of breast-milk substitutes. Retrieved from
- 4 [http://www.unicef.org/nutrition/index\\_24805.html](http://www.unicef.org/nutrition/index_24805.html)
- 5 Wangsawat, T., Kaleang, N., Phibal, A., Jaisomkom, R., & Hayeese, W., 2014. Factors
- 6 influencing intention to exclusive breastfeeding for 6 months of mothers in Naradhiwat
- 7 province. *Nursing Journal*, v41.
- 8 Watts, S., & Stenner, P., 2012. *Doing Q methodological research*. SAGE Publications, London.
- 9 Watts, S., & Stenner, P., 2008. *Doing Q methodology: Theory, method and interpretation*.
- 10 *Qualitative Research in Psychology*, 2(1), 67-91. doi: 10.1191/1478088705qp022oa
- 11 Weddig, J., Baker, S. S., & Auld, G., 2011. Perspectives of hospital-based nurses on breastfeeding
- 12 initiation best practices. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, v40(3), 166-
- 13 178. doi: 10.1111/j.1552-6909.2011.01232.x.
- 14 Woldeamanuel, B. T., 2020. Trends and factors associated to early initiation of breastfeeding,
- 15 exclusive breastfeeding and duration of breastfeeding in Ethiopia: evidence from the
- 16 Ethiopia Demographic and Health Survey 2016. *International Breastfeeding Journal*, v15(3).
- 17 World Health Organization (WHO), 2021. The World Health Organization's infant feeding
- 18 recommendation. Retrieved from
- 19 [https://www.who.int/nutrition/topics/infantfeeding\\_recommendation/en/](https://www.who.int/nutrition/topics/infantfeeding_recommendation/en/)
- 20

