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Factors Related to Exclusive Breastfeeding among Mothers in the City of Palu, Central Sulawesi, Indonesia

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ABSTRACT

Introduction: The rate of exclusive breastfeeding in Indonesia is still low. In Palu City, Central Sulawesi, exclusive breastfeeding practice in 2014 was only 59.7% which was far below the national target of 80%. This study aimed to assess modifiable potential factors that can promote exclusive breastfeeding among mothers in Palu City. **Methods**: A total of 80 mothers with a child over the age of 6-24 months attending the Bulili Health Center were recruited into the study using convenience sampling. For purposes of the study potential factors identified for assessment using a standardised questionnaire were knowledge, attitude, practice, socio-culture, formula milk exposure to commercials, and support from health professionals and family. Bivariate and logistic regression analyses were applied. **Results:** Young mothers aged 20-35 years made up more than half the sample (57.5%). In terms of education, 42.5% had graduated from junior high school. Almost two-thirds (63.75%) of the mothers were housewives. Only 26.2% of the subjects practised exclusive breastfeeding. The factors related to exclusive breastfeeding (p<0.05) were attitude, practice, socio-culture factors such as religion, culture and, influence of community and formula milk and exposure to commercials. Multivariate analysis indicated that only practice (p= 0.000), socio-culture (p=0.002) and exposure to formula milk commercials (p=0.000) were significantly associated with exclusive breastfeeding. **Conclusion:** The main modifiable factors that lead to exclusive breastfeeding among mothers in Palu are socio-culture followed by practice and formula milk commercials. Besides promotion of cultural aspects, a definite policy on infant formula commercials is needed to support exclusive breastfeeding.

Key words: Exclusive breastfeeding, exposure to formula milk commercials, practices, socio-culture

INTRODUCTION

Breast milk is the best food for 0-6 month-old infants (Motee *et al*., 2013). Protective factors and nutrients contained in breast milk ensure good nutritional status and lead to a decrease in morbidity and mortality of the child (Motee & Jeewon, 2014). Several epidemiological studies claim that breastfeeding protects infants and children from infectious diseases such as diarrhoea and acute respiratory infections (Lamberti *et al*., 2011; Tromp *et al*., 2017). The prevalence of exclusive breastfeeding is still low despite its importance in infant growth.

The persentage of exclusive breastfeeding worldwide is not at an optimal level. The prevalence of breastfeeding of infants 0-6 months of age also tends to fluctuate. It was 31%

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in 2010, increasing significantly to 55.7% in 2015 (Ministry of Health Republic of Indonesia 2015). Prevalence of exclusive breastfeeding in Palu was 59.7% in 2014 (City of Palu Health Office 2014), clearly below the national target of 80%.

Exclusive breastfeeding tends to fluctuate due to several factors which vary among regions (Khanal, Sauer & Zhao, 2013). Factors associated with exclusive breastfeeding relate to (i) maternal factors such as employment status, education, parity, workload, and knowledge of breastfeeding; (ii) socio-economic demographic factors such as age, marital status, and indicators of socio-economic status; (iii) contextual factors such as place of delivery (health facility or home) and breastfeeding support from breastfeeding counseling; (iv) cultural factors such as beliefs, norms, and cultural breastfeeding practices; and (v) infant characteristics such as age, sex, and morbidity (WHO, 2008). There is an important need to assess factors related to exclusive breastfeeding practice in order to identify modifiable factors to optimise exclusive breastfeeding.

The current study aimed to analyse the relationship between knowledge, attitude, practice, socio-cultural aspects, formula milk commercials, health professionals and family support as potential modifiable factors in exclusive breastfeeding practice among mothers in Palu, Central Sulawesi.

METHODS

Research design and study subjects

This was a cross-sectional study using convenience sampling technique. Mothers living in Bulili Health Centre coverage area with a child/children over the age of 6 to 24 months, who agreed to be respondents and were willing to be interviewed, had no major illnesses that prevented them from breastfeeding, were invited to participate in the study. The sample size was calculated by using the following formula (Yamane, 1967):

$$n = \frac{N}{1 + N\,(d)^2}$$

where n represents the sample size, N the population size, and d the level of precision which is 10%. In total, 80 mothers were selected as subjects in the study.

Data collection

Primary data were collected by direct interview using a standarised questionnaire on mothers who were visiting the health centre. A questionnaire was designed using relevant literature and expert consultation to meet the scope of the study. The questionnaire was tested for validity and reliability using the Cronbach Alpha test which gave the average value of alpha as 0.6319. The first section of the questionnaire consisted of questions about knowledge of breastfeeding including exclusive breastfeeding benefits, negative effect of not practising exclusive breasfeeding, and how to cope with exclusive breastfeeding barriers. This section contained 15 questions based on the Guttman scale (yes/no). When the score of respondents was equal or more than the median, the mothers were rated as highly knowledgeable and when the score of the respondents was less than the median, the mothers were rated as poorly knowledgeable

The second section of the questionnaire comprised questions of attitude towards exclusive breastfeeding. This part had 15 statements on exclusive breastfeeding including steps and appropriate time of exclusive breasfeeding as well as mothers' self-confidence to breastfeed exclusively. The Likert scale was used (Strongly agree, agree, disagree, and strongly disagree) and mothers were regarded as having a positive attitude if the score was equal or more than the median score and negative if the score was less than the median of the total score on exclusive breastfeeding knowledge.

The section on exclusive breastfeeding practice in the questionnaire consisted of 10 questions based on the Guttman scale (yes or no). The practice was considered positive if the score was equal or more than median of the total score in this section and negative when the score was less than the median. The socio-cultural aspect section also comprised 10 questions based on the Guttman scale (yes or no) including prelactal feeding in the very early days of the babies' life and baby showering practice in each culture. The socio-cultural aspect was considered as positive if the score was equal or more than the median while it was negative if the score was less than the median score of the total score in the exclusive breastfeeding practice section.

Exposure to formula milk commercials in the questionnaire consisted of 10 questions using the Guttman scale (yes or no). The questions included information on the advantages of infant formula and of the advertisments on infant formula on the media. When the score of the respondents was equal or more than median scores, the mothers were considered as having sufficient exposure and unexposed if the score was less than the median score.

The health professionals section in the questionnaire consisted of 10 questions using the Guttman scale (yes or no) questions on support from doctors, midwives and nurses for mothers to exclusively breastfeed their babies. Support was considered positive if the score was equal or more than median and negative if the score was less than the median. Family support in the questionnaire consisted of 14 questions using the Guttman scale (yes or no). Family support was considered as positive when the score was equal or more than the median and negative when the score was less than the median.

The study subjects were informed about study purposes and assured that the responses to the questions would remain confidential. The subjects were also informed that their participation in the study was voluntary and that they were free to decline answering any questions. Written informed consent was obtained from all subjects.

Statistical analysis

Data were subjected to univariate, bivariate and multivariate analysis. Bivariate analysis used the Chi-square test while the multivariate analysis used logistic regression.

RESULTS

The majority of the subjects were young mothers with the age ranging from 20-35 years (57.5%). The education level of most of the subjects was junior high school (42.5%); most of the mothers were housewives (63.7%) (Table 1).

The majority of the mothers (73.8%) did not exclusively breastfeed their children but in general, knowledge of exclusive breastfeeding was high (86.2%). However, only a low percentage (38.8%) of mothers had a positive attitude towards exclusive breastfeeding Most mothers were influenced by their socio-culture (87.5%) and had the support of their health professionals (77.5%) but not from their family (37.5%) to exclusively breastfeed their babies.

Results showed that the high knowledge of exclusive breastfeeding (p=0.272), positive health professional support (p=1,000) and positive family support (p=0,763) were not significantly related to exclusive breastfeeding practice while positive attitude (p=0,005), positive practice (p=0,000), positive socio-culture (p=0,002) and not exposed to formula milk commercials (p=0,00) were significantly related to exclusive breastfeeding practice among the subjects (Table 2).

Mothers who were poorly or highly knowledgeable (90.9% and 71.0% respectively) tended not to exclusively breastfeed their babies. The majority of

Table 1. Distribution of respondents by characteristics of mother

Characteristics	*Category*	*n (80)*	*%*
Age (years)	< 20	24	30,0
	20 – 35	46	57,5
	36 – 45	10	12,5
Education	Elementary	19	23,7
	Junior high school	34	42,5
	Senior high school	27	33,8
Job	Housewife	51	63,7
	Labor	19	23,8
	Dealer	10	12,5
Tribe	Kaili	57	71,2
	Bugis-Makassar	14	17,5
	Jawa	9	11,3

Source: Primary Data

Table 2. Variables associated with exclusive breastfeeding, bivariate analysis

Variables	*Exclusive breastfeeding*				*Total*		*p*
	Not practising		*Practising*				
	n	*%*	*N*	*%*	*n*	*%*	
Knowledge							
Low	10	90.9	1	9.1	11	100.0	0.272
High	49	71.0	20	29.0	69	100.0	
Attitude							
Negative	42	85.7	7	14.3	49	100.0	0.005
Positive	17	54.8	14	45.2	31	100.0	
Practice							
Negative	44	93.6	3	6.4	47	100.0	0.000
Positive	15	45.5	18	54.5	33	100.0	
Socioculture							
Negative	44	86.3	7	13.7	51	100.0	0.002
Positive	15	51.7	14	48.3	29	100.0	
Formula milk commercials exposure							
Exposed	42	89.4	5	10.6	47	100.0	0.000
Not exposed	17	51.5	16	48.5	33	100.0	
Health professional support							
Negative	6	75.0	2	25.0	8	100.0	1.000
Positive	53	73.6	19	26.4	72	100.0	
Family support							
Negative	18	78.3	5	21.7	23	100.0	0.763
Positive	41	71.9	16	28.1	57	100.0	

Source: Primary Data, 2015

Table 3. Variables associated with exclusive breastfeeding, multivariate analysis

Variable	*B*	*S.E.*	*Wald*	*df*	*Sig.*	*Exp(B)*	*95.0% C.I.for Exp(B)*	
							Lower	*Upper*
Attitude	1.884	1.037	3.300	1	0.069	6.580	0.862	50.231
Practice	3.765	1.183	10.125	1	0.001	43.160	4.246	438.726
Socioculture	4.119	1.285	10.274	1	0.001	61.513	4.955	763.619
Exposure to formula milk commercials	2.950	1.077	7.498	1	0.006	19.109	2.313	157.892

Source : Primary Data, 2015

respondents with and without support from health professionals for not practising exclusive breastfeeding accounted for 73.6% and 75%, respectively. Most respondents with and without family support also did not exclusively breastfeed their children (71.9% and 78.3%) (Table 2).

The percentage of mothers with a negative attitude towards non exclusive breastfeeding was much higher (85.7%) compared to mothers with a positive attitude (54.8%). The rather high percentage (93.6%) of mothers who had scored negative for practice also did not breastfeed their babies exclusively. Mothers without socio-cultural support failed to breastfeed their babies exclusively. Only 13.7% of mothers without socio-cultural support breastfeed their babies exclusively,

The percentage of exclusively breastfeeding mothers with social support was high (48.3%), eventhough 51.7 percent of mothers with sociocultural support also did not breastfeed their babies exclusively. Mothers who were exposed to formula milk commercials tended not to breastfeed their babies exclusively (89.4%), compared to those who were not exposed to such commercials(10.6%) (Table 2).

Multivariate analysis using multiple logistic regression test showed that of the five research variables included in the analysis that indicated $p<0.25$ in the bivariate analysis, four variables contributed significantly ($p<0.05$), namely, attitude, practice, socio-cultural aspect, and exposure to formula milk commercials. Multivariate analysis showed that the variable that had the most influence was socio-cultural support, followed by practice and exposure to formula milk commercials (Table 3).

DISCUSSION

The results showed that attitude, practice, socio-cultural aspect, and exposure to formula milk commercials were significantly associated with exclusive breastfeeding. However, only practice, socio-culture, and exposure to formula milk commercials continued to be significantly associated with exclusive breastfeeding after the multivariate analysis.

The success of exclusive breastfeeding for infants depends on several factors. Of significance are underlying factors that include family support, medical and cultural, attitude and norms, demographics and economic condition, commercial pressure, national polices and norms (Temple *et al.*, 2016).

Our results revealed that mothers' attitude was significantly associated with exclusive breastfeeding pattern. Mothers with a negative attitude were 4.9 times more likely not to exclusively breastfeed than mothers with a positive attitude. This study found that the majority of mothers (73.8%) did not exclusively breastfeed their

children. Mothers perceived themselves as not having sufficient milk for their babies and therefore did not attempt to breastfeed exclusively. The mothers were also under the impression that they should give formula milk when breast milk was not sufficient.

A more positive attitude toward breastfeeding is related to positive breastfeeding outcomes (Zhang *et al*., 2009; Jessri *et al*., 2013). Mothers' confidence in their ability to breastfeed is a key factor for succesful breastfeeding practice and efforts that enhance mothers self-efficacy or behaviour are also effective in prolonging breastfeeding duration (Meedya *et al*., 2014).

However, in this study, the significant association between mothers' attitude and exclusive breastfeeding practice disappeared with the adjustment of other variables. The significant association between a positive socio-culture as well as non exposure to formula milk commercials with succesful exclusive breastfeeding practice may explain this finding.

The results showed that respondents with no socio-cultural background of exclusive breastfeeding practice would not breastfeed at all, and vice versa. Mothers might be very familiar with the benefits of breast milk and may have a positive attitude towards exclusive breastfeeding but a family with a strong culture and religion may not be influenced by their knowledge and positive attitude towards exclusive breastfeeding (Thet *et al*., 2016; Sika & Oduro, 2013).

The majority of subjects in this study were Muslims. Islamic guidance states that being breastfed is one of the rights of a child, thus mothers also have a duty to breastfeed their children. In Malaysia, Islamic guidance has a vital role in developing a breastfeeding culture (Emma *et al*. 2013). In this study, most of the subjects were Muslims but still the percentage of exclusive breastfeeding was low. The religious basis for breastfeeding and the cultural practice may not coincide, causing conflicting decision making among mothers. Cultural and social beliefs also influence breastfeeding practices (Kimani-Murage *et al*., 2015). According to Textor, Tiedj & Yawn (2013), the percentage of breastfeeding practice is low among mothers with low social support (Textor *et al*., 2013).

Exposure to infant formula commercials is also significantly associated with exclusive breastfeeding practice. Mothers who are more exposed to formula milk commercials are less likely to breastfeed their babies exclusively. In Kathmandu, Nepal, infant formula was recommended by health providers to 36% of recently delivering mothers (Pries, Huffman & Champeny, 2014).

The infant formula industry has had a significantly adverse impact on breastfeeding rates through strategic marketing, including direct commercials with the implicit and explicit endorsement of health providers (Kaplan & Graff 2008). Some advertisements on improvements in infant formula are directed at assuring mothers that the formula is safe for babies to consume (Kent, 2015). Mothers develop a preference for formula milk as the best choice for babies because they receive repeated information from commersials.

Health professionals and family support were also factors of exclusive breastfeeding practice assessed in this study. Health professionals play a very special role in supporting exclusive breastfeeding (Gage *et al*., 2012). The support they give can instill confidence in mothers to breastfeed (Sriraman & Kellams 2016). Support from husbands and family can also strengthen maternal motivation to commit to exclusive breastfeeding. Husbands' support for breastfeeding and colostrum feeding have been found to be independent predictors of exclusive breastfeeding practice (Tewabe, 2016).

However, support from both health professionals and family was not significantly associated with exclusive breastfeeding practice in this study perhaps due to the significant contribution of sosio-cultural influence on mothers' breastfeeding behaviour. Mothers may have support from health professionals and their family, but as long as their culture requires them to conduct rituals that they believe will bless their babies with good things, they would rather comply with customary beliefs.

This study implies that socio-cultural support plays a fundamental role in assuring that babies are exclusively breastfed in Palu, Central Sulawesi, Indonesia. Breastfeeding is the recommended practice in all religions, thus religious support together with culture, and support from family and health professionals will help mothers to successfully breastfeed their children exclusively. Futhermore, this study also confirmed that infant formula advertisements have a significant negative contribution towards exclusive breastfeeding practice. Infant formula milk industries provide incentives to health providers with the highest sales and also presents for mothers with the highest frequency of purchasing formula products (Thomson *et al*., 2012; Whelan *et al*., 2014). This insentive method could be an alternative to increasing exclusive breastfeeding coverage (Thomson et al. 2012; Whelan et al. 2014). Investments on promoting, protecting, and supporting breastfeeding practice will bring significant benefits to society (Piwoz & Huffman, 2015).

CONCLUSION

Our results indicate that the factors related to exclusive breastfeeding in Palu are practice, socio-cultural aspect, and exposure to formula milk commercials. Therefore, cultural aspects may need to be enhanced or reinforced for the community. Guidelines or even a definite policy on infant formula commercials that supports exclusive breastfeeding should be initiated.

Conflict of interest

The authors declare that there is no conflict of interest.

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APPENDIX

Knowledge Questionnaire

No	Question	Yes	No
1	Breast milk is the most perfect food for babies.		
2	Exclusive breastfeeding is breastfeeding without other additional food and drink in baby 0-6 months of age.		
3	Breast milk secreted on the first day until the third or fourth days is usually yellow or yellowish and is called colostrums.		
4	Is exclusive breastfeeding beneficial to improve the baby's body resistance and to the growth of the brain?		
5	One of the benefits of breastfeeding is to strengthen bond of love between a mother and her baby.		
6	Breast milk secreted after the colostrum before becoming mature milk is called transitional milk.		
7	Breast milk can increase the power of vision and eloquence.		
8	A baby who is not exclusively breastfed is more vulnerable to illness than one who is exclusively breastfed.		
9	Breast milk can cause the baby to get diarrhea.		
10	The method to increase breast milk is that mothers should breastfeed as often as possible and consume nutritious food that contains lots of liquid.		
11	For mothers, breastfeeding can function as a natural method of contraception, is practical and reduces the possibility of uterine cancer.		
12	Breast milk can be given immediately to the baby without preparing or cooking water first.		
13	Is a baby who is exclusively breastfed not susceptible to infectious diseases?		
14	Is the baby who consumes formula milk just as healthy as the baby who is breastfed exclusively?		
15	Is it true that the benefits of breastfeeding can reduce the risk of breast cancer as well as help mother to lose weight?		

Attitude Questionnaire

Annotation : SA = Strongly Agree
A = Agree
D = Disagree
SD = Strongly Disagree

No	Question	SA	A	D	SD
1	A mother has to clean her breasts before breastfeeding her baby.				
2	I am more concerned with my work than breastfeeding.				
3	A working mother who breastfeeds her baby does not need a breastfeeding corner because there is formula milk.				
4	A mother should give colostrum to her baby from the first day until the fourth day. better for husband to give fomula milk for the baby.				
6	Mother should wash her hands first with soap before feeding her baby.				
7	Currently, expensive formula milk has more complete nutritional contents than breast milk				
8	Daily activities should not be a barrier for a mother to breastfeed.				
9	At the age of 0-6 months, when the baby is hungry, mother should breastfeed immediately.				
10	When traveling, a mother should not breastfeed because it is embarrassing				
11	Breastfeeding requires skill or special and appropriate treatment				
12	Breastfeeding can improve inner relationship between a mother and her baby				
13	Mothers who do not breastfeed lead to reduction of breast milk.				
14	Breastfeeding should continue until the baby is two years old				
15	For working mothers, breast milk can be replaced with formula milk				

Practice Questionnaire

No	Question	Yes	No
1	Mothers should discard the first secretion of breastmilk (colostrum) because it can cause diarrhea.		
2	Mothers give special care on their breast to facilitate breastfeeding by massaging breast.		
3	Mothers should still breastfeed even though the breast milk production is not optimal.		
4	A mother should give formula milk when breast milk is not secreted.		
5	Mothers should breastfeed their baby with the correct feeding position in which the baby's body parts stick to the mothers.		
6	Prior to work, mothers give formula milk instead of breast milk.		
7	Mothers breastfeed the baby with the correct feeding position to reduce the risk that may appear when breastfeeding such as nipple pain and swelling.		
8	Mothers should let their baby burp by patting on his/her back after breastfeeding to avoid baby's choking.		
9	Mothers should eat plenty of katuk leaves, fruit and vegetables they believe will help them produce a lot of milk.		
10	Mothers breastfeed their baby soon after the baby is born.		

Socio-culture Questionnaire

No	Question	Yes	No
1	Do families and communities in your environment have a habit of giving tea, honey, sugar, coffee, water, milk in addition to breast milk and / or other to babies at the age of 0-6 months?		
2	Do families and communities in your environment have a habit of giving rice, banana, papaya, and or juice to babies at the age of 0-6 months?		
3	Do families and communities in your environment usually give first secretion of breast milk (yellow colostrum) to babies?		
4	Has your baby ever been treated/taken care of by parents and / or your aunt at the age of 0-6 months?		
5	Does your religion recommend breastfeeding to babies?		
6	Do you perform traditional ceremonies associated with the birth of a baby at the age of 0-6 months (aqiqah) where the baby's mouth should be smeared with honey, water and coconut water?		
7	Is it common to give food other than breast milk when a baby cries at the age of 0-6 months?		
8	Is it common to smear honey, herb, or coffee on mother's nipple during breastfeeding to the baby aged 0-6 months?		
9	Is it common to apply drug on nipple's mother when a mother breastfeeds her baby aged 0-6 months?		
10	Is it common to cover mother's nipple when a mother breastfeeds her baby aged 0-6 months?		

Formula Milk Commercials Exposure Questionnaire

No	Question	Yes	No
1	Do you get information about formula milk for the baby 0-6 months of age?		
2	Have you ever seen a commercials of formula milk on TV, internet and / or in a movie?		
3	Have you ever read the commercials of formula milk in magazines, newspapers and / or books?		
4	Have you ever received commercials of formula milk on the internet such as Facebook, Twitter and / or other social media?		
5	Have you heard about milk formula commercials on the radio?		
6	Do you think that formula milk commercials turn mothers from exclusive breastfeeding to giving formula milk to babies?		
7	Does the information on formula milk you get from commercials contain the nutrient content of Docosahexaenoic Acid (DHA), Linoleic Acid (LA), α-Linoleic Acid (ALA), and Arachidonic Acid (AA) fatty acid?		
8	Do commercials of formula milk contain information about preparation guide for the baby aged 0-6 months?		
9	Do formula milk commercials give information on types of milk according to the age of babies ranging from 0-6 months?		
10	Do you find the commercials of formula milk interesting?		

Health Professionals Support Questionnaire

No	Question	Yes	No
1	Did you have your pregnancy checked by a health professional?		
2	Did you receive education about exclusive breastfeeding from health professionals when you went for your check-up during pregnancy?		
3	Did you get support and encouragement from health professionals about the importance of exclusive breastfeeding for the baby aged 0-6 months?		
4	Did the health professional explain the benefits of exclusive breastfeeding to you?		
5	Does the health professional frequently provide education in your area?		
6	Did the health professional educate you on how breast milk should be given?		
7	Did the health professional tell you the right time to breastfeed exclusively?		
8	Did the health professional tell you about the impact of not giving exclusive breastfeeding to the baby?		
9	Did the health professional give information about an early initiation of breastfeeding to you?		
10	Did the health professional explain that the early initiation of breastfeeding is very important because the colostrum content is good for the baby?		

Family Support Questionnaire

No	Question	Yes	No
1	Do you live with your family?		
2	Does your family inform you that baby aged 0-6 months can be given only breast milk without any other food like banana, bottled milk, or soft rice?		
3	Does your family provide reading material about exclusive breastfeeding to the baby such as magazines, books and others?		
4	Does your family accompany you when a health professional educates you about exclusive breastfeeding?		
5	Does your family like to ask you about the problem you face during breastfeeding period?		
6	Does your family accompany you when you breastfeed?		
7	Does your family provide music/TV so that the atmosphere is comfortable when you breastfeed at home?		
8	Does your family assure you that you can give exclusive breastfeeding to your baby up to 6 months?		
9	Does your family advise you not to be afraid to breastfeed the baby due to changes in your body?		
10	Does your family always encourage a quiet environment at home while you are breastfeeding?		
11	Does your family help you if you need something such as picking up diapers or getting you a drink while you breastfeed?		
12	Does your family participate to help you check the health of the baby at a health center, clinic or other health facilities during the breastfeeding period?		
13	Does your family provide a peace of cloth to cover the baby when you breastfeed in a public place?		
14	Does your family provide nutritious food for you during the breastfeeding period?		